CTPS TECHNICAL REPORT

47

AN IMPACT ANALYSIS OF THE OPENING OF THE QUINCY ADAMS RAPID-TRANSIT STATION

November 1984

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TITLE An Impact Analysis of the Opening of the Quincy Adams Rapid-transit Station

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DATE November 1984

ABSTRACT This report describes the effects on South-Shore-corridor transit-travel patterns of the opening of the Quincy Adams Red Line Station on September 10, 1983. Data on transit ridership and the use of parking facilities at corridor transit stations were collected before and after the new station opened. These data are compared herein. A passenger-survey questionnaire was handed out at the five South Shore transit stations on February 29, 1984. The survey data, which describe the passengers' socioeconomic characteristics and perception of the quality of the transit service they receive, are also analyzed in this report.

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Massachusetts Bay Transportation Authority
Massachusetts Department of Public Works
MBTA Advisory Board
Massachusetts Port Authority
Metropolitan Area Planning Council

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ACKNOWLEDGMENTS

The author of this report wishes to thank the many individuals and the agencies that helped collect the data for this study. MBTA personnel did bus- and transit-ridership counts; personnel of CTPS, the Metropolitan Area Planning Council (MAPC), and the Massachusetts Department of Public Works (MDPW) surveyed the parking facilities at the various stations; CTPS and MBTA personnel distributed the passenger-survey questionnaire; and the MDPW provided CTPS with traffic-volume data.

SUMMARY

Quincy Adams Station, located near the Quincy/Braintree line, was opened for operation by the Massachusetts Bay Transportation Authority on September 10, 1983. This report presents an evaluation of the impact of the station opening on commuting patterns in the South Shore corridor.

Data on transit and bus ridership, license plate numbers of vehicles parked in facilities associated with the transit stations on the South Shore Extension of the Red Line, and traffic-volume data were collected before the station opened and again in February 1984, so that a comparison of "before" and "after" characteristics could be made. Also, a passenger questionnaire eliciting data on current and previous trip-making behavior and on socioeconomic characteristics was distributed at the stations in February. The overall response rate to the questionnaire was 31 percent; the data obtained were expanded to reflect the total AM-peak (6:30-9:30) ridership on the day of the survey.

Boarding information was available for three different days before Quincy Adams Station opened and for three days (including the survey day) after the station opened. These data were averaged and adjusted for seasonal fluctuations to produce the "before" and "after" ridership figures used for comparison. The results show an increase in ridership of 6.6 percent (842 persons). Not all of this increase can necessarily be attributed to the opening of the new station.

On the day of the passenger survey (February 29, 1984), 13,789 people boarded at the five stations on the South Shore Extension during the morning peak period. The survey results indicate that 11 percent of these people were new riders. Of these, 51 percent did not make their specific survey-day trip "before." Of the 89 percent of "after" morning-peak riders who had also used the Red Line prior to the opening of Quincy Adams, a significant number had shifted from one boarding station to another. The largest number had switched to the Quincy Adams Station from the Braintree Station.

An overwhelming majority (92 percent) of the surveyed (morning-peak) trips were work trips. Eighty-nine percent of all trips had destinations in the City of Boston. A majority (69 percent) of the respondents lived in Quincy, Weymouth, or Braintree. The most common mode of access to Quincy Adams Station was auto (80 percent of the trips were park and ride, 10 percent kiss and

ride). A majority of the respondents who boarded at Braintree Station also arrived by auto. Quincy Center Station was more oriented toward access by bus and by walking, while Wollaston and North Quincy stations were most frequently reached by walking and by auto.

The most cited reason for using the Red Line was the negative aspects of driving, rather than the benefits of using public transportation. Approximately five percent of the survey respondents indicated that they had made some change in work hours, shopping habits, jobs, etc. because of the opening of Quincy Adams Station. Almost one-third (30 percent) of those who responded to the survey had no auto available for the trip made on the survey day.

Differences in the trip-making characteristics of new and continuing riders were compared. New riders were more likely to park and ride and somewhat less likely to walk to transit stations. While work was the predominant trip purpose for all riders, new riders made proportionately more school trips than continuing riders. New riders were also younger and used the transit system less frequently than regular riders.

In comparing the survey results with the survey conducted when Braintree Station opened in 1980, it was found that there has been an increase in the proportion of riders coming from communities other than Quincy, Weymouth, and Braintree, and that there has been an increase in the use of the auto as a mode of access to the stations.

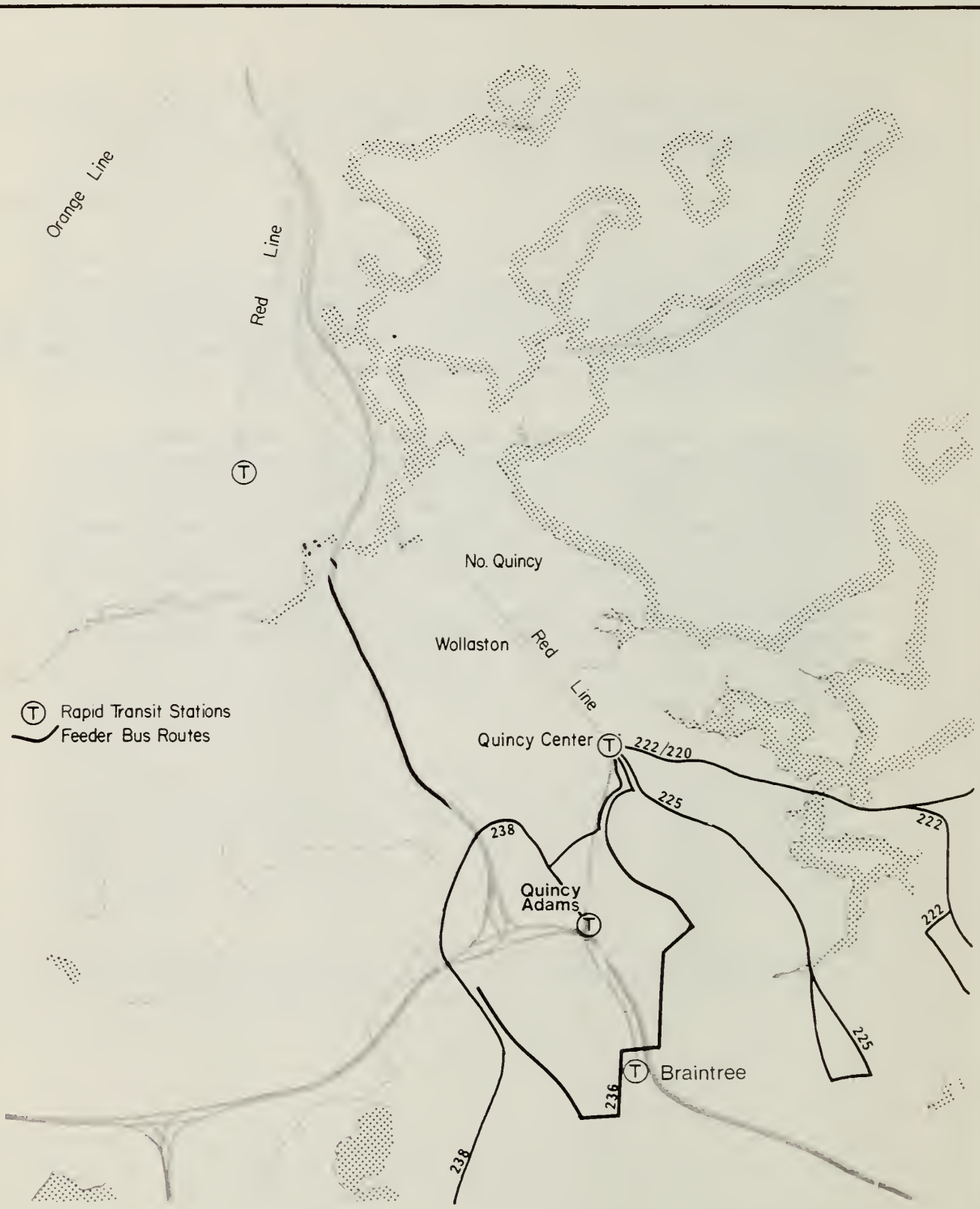
An analysis of the use of the parking facilities at the South-Shore-Extension stations revealed that those at the Braintree and Wollaston stations were at capacity by approximately 8:00 A.M. after Quincy Adams opened. The arrival rate peaked earlier "after" at all stations except Quincy Center, which was the only station at which parking seemed to have decreased.

An analysis of traffic volumes on selected roadways in the vicinity of Quincy Adams Station showed increased in A.M.-peak, P.M.-peak and average daily volumes.

1.0 INTRODUCTION

The Massachusetts Bay Transportation Authority (MBTA) opened Quincy Adams Station on September 10, 1983. This rail-rapid-transit station is located near the Quincy/Braintree line, on the South Shore Extension of the Red Line. The purpose of this study is to assess the impacts of the new station on traffic patterns and travel habits in the South Shore corridor.

The Central Transportation Planning Staff (CTPS), MBTA, Metropolitan Area Planning Council (MAPC), and Massachusetts Department of Public Works (MDPW) collected information on passenger boardings, use of parking facilities, and traffic volumes in the vicinity of the station before the station opened and again in February 1984. A passenger survey was also handed out to passengers boarding at the five stations on the South Shore Extension (see Figure 1-1 which also shows feeder routes) on February 29 to determine socioeconomic characteristics and changes in travel patterns. These are the data analyzed in this report.



RAPID TRANSIT STATIONS ON THE RED LINE
(SOUTH SHORE EXTENSION) AND SELECTED FEEDER BUS ROUTES

FIGURE 1-1

2.0 PUBLIC TRANSPORTATION RIDERSHIP

2.1 TRANSIT RIDERSHIP

Ridership counts were taken at fifteen-minute intervals during the morning peak at the South-Shore-Extension stations on three days before Quincy Adams Station opened and on three days afterward. The counts were averaged and adjusted for seasonal fluctuations to determine composite "before" and "after" morning peak period ridership. The counts taken on the day of the passenger survey were used as a control to expand the questionnaire responses. The composite "before" and "after" data are summarized in Table 2-1.

On an average day before Quincy Adams Station opened, 12,718 people boarded at the four Red Line stations during the morning peak period. On an average day after the station opened, 13,560 people boarded at the five stations. This represents a 6.6-percent increase (842 persons). It appears that Quincy Center and North Quincy are the only stations where ridership decreased.

The distribution of boardings by station at fifteen-minute intervals on the survey day (February 29) is presented in Table 2-2 and Figure 2-1. The peak fifteen-minute intervals at Braintree and Quincy Center occurred between 7:15 and 7:30 A.M. At Wollaston and North Quincy, the peak fifteen-minute interval occurred between 7:30 and 7:45 and 8:00 and 8:15, respectively. The peak hour began fifteen minutes earlier (7:00 A.M.) at Braintree than at Quincy Center, Wollaston, and North Quincy. Note that the peak hour did not begin until 7:45 at Quincy Adams.

After Quincy Adams Station opened, the peak hours at Braintree, Quincy Center, and Wollaston started fifteen minutes earlier than before, and the peak fifteen-minute interval at Quincy Center started forty-five minutes earlier than before. Except at Wollaston Station, boardings during the peak fifteen minutes represented a larger proportion of total morning peak boardings than before Quincy Adams opened.

2.2 BUS RIDERSHIP

Ridership on four MBTA bus routes was examined for changes resulting from the opening of Quincy Adams Station: Routes 220 (Quincy Center to Hingham), 222 (Quincy Center to East Weymouth), 225 (Quincy Center to Weymouth Landing), and 238 (Quincy Center to Randolph). Only Route 238 directly serves Quincy Adams

	Ridership*					
	Before		After		Difference	
	#	%	#	%	#	%
Braintree	3,285	25.8%	3,423	25.2%	+138	+4.2%
Quincy Adams	-	-	1,192	8.8	+1,192	-
Quincy Center	3,691	29.0	3,141	23.2	-550	-14.9
Wollaston	2,923	23.0	3,061	22.6	+138	+4.7
North Quincy	2,819	22.2	2,743	20.2	-76	-2.7
Total	12,718	100.0%	13,560	100.0%	+842	+6.6%

*Represents an average of observations in April, May, and June 1983 for "before" data and November 1983 and January and February 1984 for "after" data. Each observation was adjusted to reflect monthly variation in boardings by using a boarding index for 1982 (the latest information available).

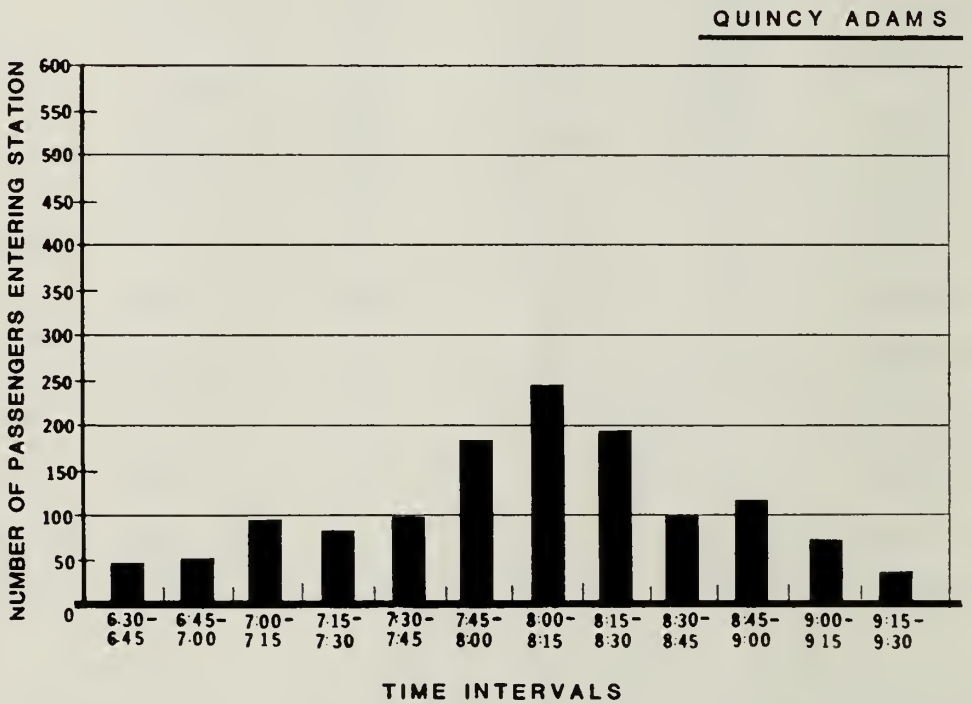
BOARDINGS BEFORE AND AFTER
THE OPENING OF QUINCY ADAMS STATION
(6:30-9:30 A.M.)

TABLE 2-1

Time Interval	Stations					Total
	Braintree	Quincy Adams	Quincy Center	Wollaston	North Quincy	
6:30-6:45	293	47	166	160	97	763
6:45-7:00	324	51	281	220	145	1,021
7:00-7:15	533	97	272	322	206	1,430
7:15-7:30	556	83	525	501	324	1,989
7:30-7:45	494	99	389	540	311	1,833
7:45-8:00	401	185	379	500	282	1,747
8:00-8:15	217	247	329	390	393	1,576
8:15-8:30	133	194	231	300	277	1,135
8:30-8:45	86	100	178	215	314	893
8:45-9:00	79	119	159	145	148	650
9:00-9:15	63	73	82	80	113	411
9:15-9:30	58	33	77	85	88	341
Total	3,237	1,328	3,068	3,458	2,698	13,789

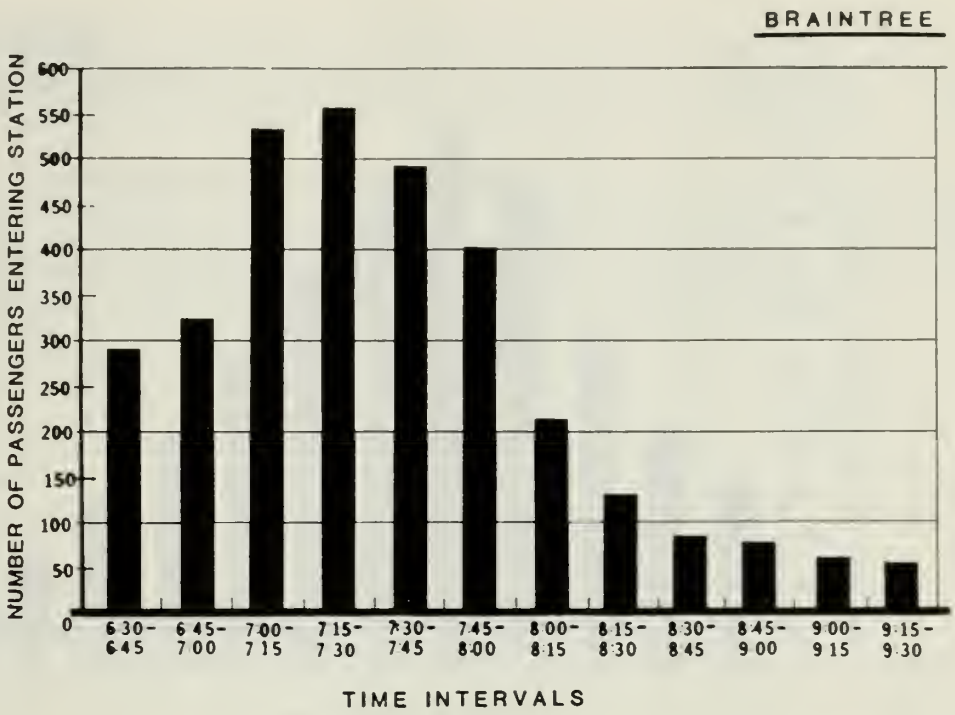
SOUTH SHORE RED LINE EXTENSION BOARDINGS
6:30-9:30 A.M.
February 29, 1984

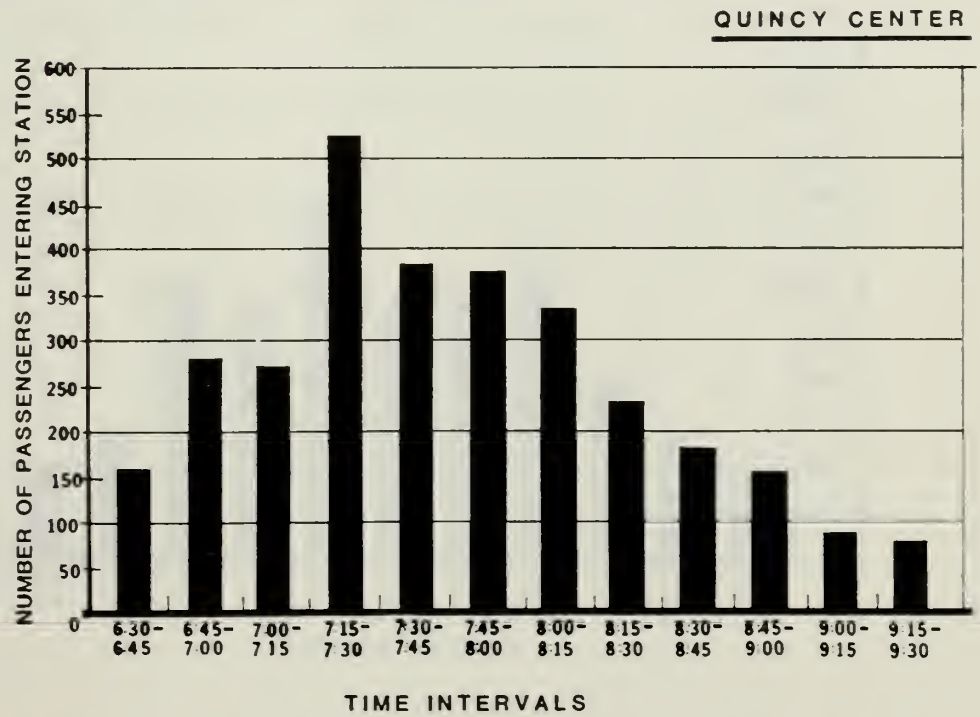
TABLE 2-2



PASSENGER BOARDINGS BY STATION
A.M., February 29, 1984

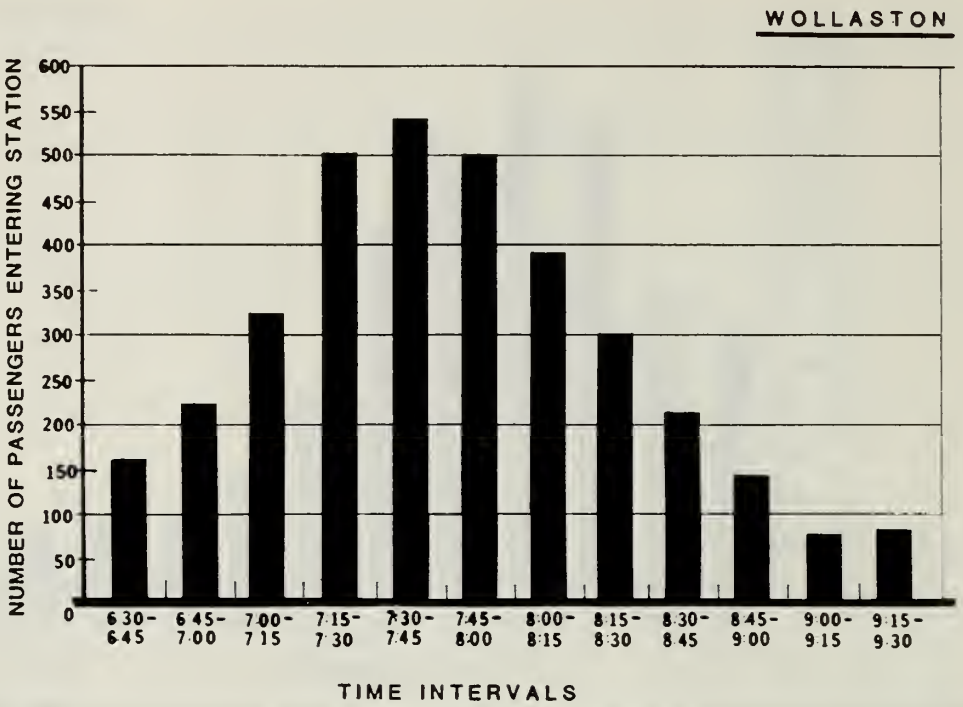
FIGURE 2-1 (p.1)

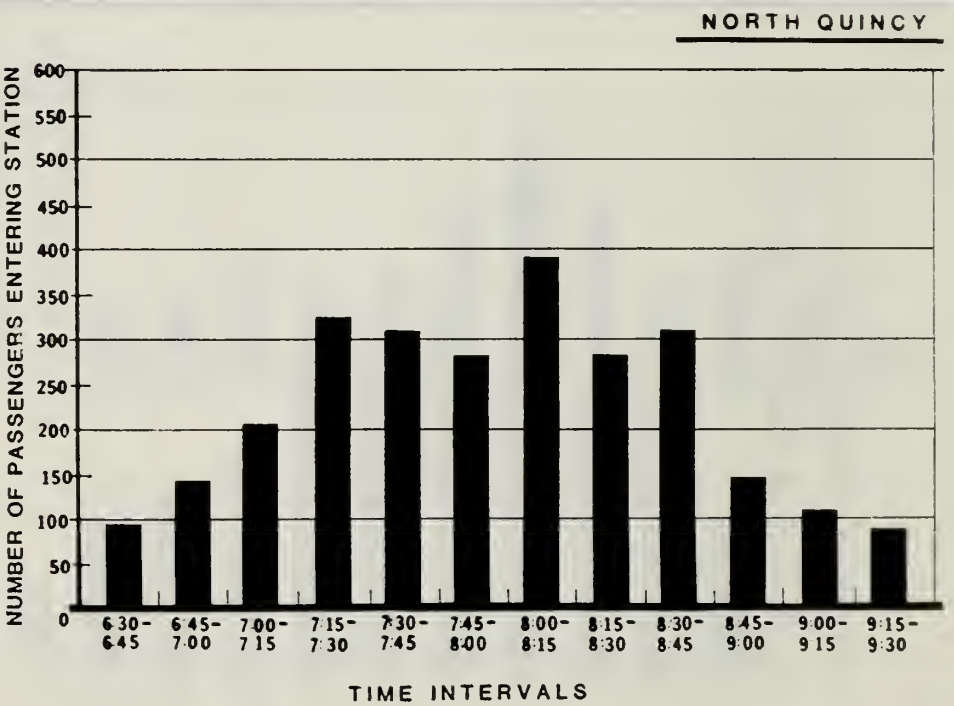




PASSENGER BOARDINGS BY STATION
A.M., February 29, 1984

FIGURE 2-1 (p.2)





PASSENGER BOARDINGS BY STATION
A.M., February 29, 1984

FIGURE 2-1 (p.3)

Station. Counts were taken before and after the station opened, and there appear to have been no significant changes in ridership on any route.

Changes in ridership on private carriers were not determined directly; however, impacts can be determined indirectly from responses to the questionnaire. As shown in Table 3-4 in section 3-2, six percent of new riders who responded to the survey used private buses before Quincy Adams Station opened.

3.0 PASSENGER SURVEY

On February 29, 1984, people boarding the Red Line at the five South-Shore-Extension stations were asked to complete a questionnaire (Figure 3-1), in order to obtain information on changes in travel patterns that might have occurred as a result of the opening of Quincy Adams Station. The requested information included socioeconomic characteristics, current trip-making characteristics, trip-making characteristics prior to the opening of Quincy Adams, reasons for using the Red Line, and comments on service.

CTPS and MBTA personnel distributed a total of 7,843 questionnaires to people entering the five stations between 6:30 and 9:30 A.M. Respondents were asked to either deposit their completed questionnaires in boxes provided on the station platforms or mail them back (with postage paid by CTPS). The number of questionnaires distributed and the number returned, by station, are presented in Table 3-1.

Of those entering the five stations on the survey day, 56.9 percent took questionnaires. The proportion of boarders who accepted the forms at each station ranged from a low of 35.6 percent at Wollaston to a high of 86.4 percent at Quincy Center.

The overall response rate (number of questionnaires returned as a proportion of total boardings for the morning peak period) was 30.7 percent. The lowest response rate was at North Quincy (23.0 percent), the highest at Quincy Adams (46.7 percent). The rates were deemed adequate to ensure that the sample is representative of the population as a whole.

3.1 SOCIOECONOMIC CHARACTERISTICS

The socioeconomic characteristics of the survey respondents are presented in Table 3-2. The elderly and the young composed only three percent, whereas, 53 percent were between the ages of 25 and 44. Almost half (49 percent) of those who responded had an annual household income greater than $30,000. Fifteen percent had incomes of $50,000 or more. Eight percent of the respondents did not own autos. However, the transit-dependent population was much larger than this: 30 percent of all respondents had no auto available for the trip made on the survey day.

Nº 21235

Passenger Survey/Quincy Adams Impact Analysis

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY

The information you provide on this questionnaire will help the MBTA evaluate the Quincy Adams Station. Please drop the completed form in the box provided on the platform or in any U.S. mailbox. Postage is prepaid.

1. AT WHICH STATION WERE YOU HANDED THIS QUESTIONNAIRE?

6-1__ Braintree
-2__ Quincy Adams
-3__ Quincy Center
-4__ Wollaston
-5__ North Quincy

2. HOW DID YOU GET TO THIS STATION THIS MORNING?

7-1__ drove alone and parked
-2__ drove with others and parked
-3__ rode with others and parked
-4__ dropped off at station
-5__ MBTA bus (Route #_____) 8[ ][ ][ ]
-6__ non-MBTA bus (Company_____) 11[ ][ ][ ]
-7__ walked
-8__ bicycled
-9__ other (_____)

3. AT WHICH STATION WILL YOU LEAVE THE RAPID TRANSIT SYSTEM?

_____ 14[ ][ ][ ]

4. WHAT IS THE FINAL DESTINATION OF YOUR TRIP?

_____ 17[ ][ ][ ][ ]
(Town/City) (zip code)

5. WHAT IS THE PURPOSE OF THIS TRIP?

20-1__ work
-2__ school
-3__ shopping
-4__ personal business
-5__ social/recreational
-6__ other (_____)

6. DID YOU USUALLY USE THE RED LINE FOR THIS TRIP BEFORE THE QUINCY ADAMS STATION OPENED LAST SEPTEMBER?

21-1__ yes - *If yes, go to Question 7*
2__ no - *If no, go to Question 10*

7. AT WHICH STATION DID YOU PREVIOUSLY BOARD THE TRAIN?

22-1__ Braintree
-2__ Quincy Center
-3__ Wollaston
-4__ North Quincy
-5__ Other (_____)

8. HOW DID YOU USUALLY GET TO THAT STATION?

23-1__ drove alone and parked
-2__ drove with others and parked
-3__ rode with others and parked
-4__ dropped off at station
-5__ MBTA bus (Route #_____) 24[ ][ ][ ]
-6__ non-MBTA bus (Company_____) 27[ ][ ][ ]
-7__ walked
-8__ bicycled
-9__ other (_____)

FIGURE 3-1 (p.1)

9. HOW MANY DAYS PER WEEK DID YOU USUALLY USE THE RED LINE TO MAKE THIS TRIP BEFORE THE QUINCY ADAMS STATION OPENED?

10 1 | five or more
2 | four
3 | three
4 | two
5 | one
6 | less than one

PLEASE SKIP TO QUESTION 11

10. BEFORE THE QUINCY ADAMS STATION OPENED LAST SEPTEMBER, HOW DID YOU USUALLY MAKE THIS TRIP?

11 1 | drove alone
2 | carpooled (number of others in carpool _____) 12
3 | bus (specify route or bus company _____) 13
4 | did not make this trip
5 | other (please specify: _____)

11. HOW MANY DAYS PER WEEK DO YOU CURRENTLY USE THE RED LINE TO MAKE THIS TRIP?

16 1 | five or more
2 | four
3 | three
4 | two
5 | one
6 | less than one

12. WHAT ARE YOUR MAIN REASONS FOR USING THE RED LINE? (Check all that apply)

17
1 | avoid traffic
2 | auto not available
3 | lower cost
4 | conserve gasoline
5 | avoid downtown parking
6 | comfort
7 | less travel time
8 | other (_____)

13. AS A RESULT OF THE OPENING OF THE QUINCY ADAMS STATION, DID YOU

40 1 | relocate your housing
2 | change jobs
3 | change schools
4 | change work hours
5 | sell an auto
6 | change shopping habits
7 | other (_____)
8 | none of the above

14. WHERE DO YOU LIVE?

_____ 41
(town/city) (zip code)

15. HOW MANY CARS DO YOU HAVE IN YOUR HOUSEHOLD?

44 1 | none
2 | one
3 | two
4 | three or more

17. WHAT IS YOUR AGE?

46 1 | 17 and under
2 | 18-24
3 | 25-34
4 | 35-44
5 | 45-64
6 | 65 and over

18. IN WHICH RANGE IS YOUR ANNUAL FAMILY INCOME?

47 1 | under $5,000
2 | $5,000-$9,999
3 | $10,000-$14,999
4 | $15,000-$19,999
5 | $20,000-$24,999
6 | $25,000-$29,999
7 | $30,000-$39,999
8 | $40,000-$49,999
9 | $50,000 and over

19. ON THE LEFT, BELOW, ARE LISTED SEVERAL DIFFERENT MEASURES OF TRANSIT SERVICE QUALITY. PLEASE CIRCLE A NUMBER AFTER EACH MEASURE TO INDICATE HOW YOU FEEL ABOUT MBTA RED LINE RAPID TRANSIT SERVICE.

	very poor		average		unusually good	
Reliability (I can count on getting there on time)	1	2	3	4	5	48
Cleanliness of the trains	1	2	3	4	5	49
Comfort of the ride	1	2	3	4	5	50
Adequate seating on board	1	2	3	4	5	51
Appearance of the cars	1	2	3	4	5	52
Trains come on schedule	1	2	3	4	5	53
Appearance of stations	1	2	3	4	5	54
Helpfulness of MBTA personnel	1	2	3	4	5	55

THANK YOU FOR COMPLETING THE SURVEY. PLEASE WRITE ANY COMMENTS OR SUGGESTIONS IN THE SPACE BELOW 56

FIGURE 3-1 (2 of 3)

Station	Number of Peak Period Passengers 2/29/84	Number of Questionnaires Distributed	Percentage of Coverage	Number of Respondents*	Response Rate	Expansion Factor
Braintree	3,237	1,837	56.7%	1,001	30.9%	3.2338
Quincy Adams	1,328	1,100	82.8	620	46.7	2.1419
Quincy Center	3,068	2,652	86.4	1,139	37.1	2.6936
Wollaston	3,458	1,233	35.6	854	24.7	4.0492
North Quincy	2,698	1,021	37.8	620	23.0	4.3516
Total	13,789	7,843	56.9%	4,234	30.7%	3.2567

*Does not include returned questionnaires with unusable data.

TABLE 3-1

SURVEY RESPONSE RATES

Auto Ownership	#	%
None	1,032	. 8%
One	6,061	45
Two	4,557	33
3+	1,961	14
No response	178	-
	13,789	100%

Auto Available for Trips	#	%
Yes	9,525	70%
No	4,032	30
No response	232	-
	13,789	100%

Age	#	%
17 and under	109	1%
18-24	2,758	20
25-34	4,618	34
35-44	2,527	19
45-64	3,208	24
65+	291	2
No response	278	-
	13,789	100%

Income	#	%
Under $5,000	158	1%
$ 5,000-$ 9,999	301	2
$10,000-$14,999	1,195	10
$15,000-$19,999	1,690	14
$20,000-$24,999	1,549	13
$25,000-$29,999	1,384	11
$30,000-$39,999	2,497	20
$40,000-$49,999	1,688	14
$50,000+	1,883	15
No response	1,444	-
	13,789	100%

SOCIOECONOMIC CHARACTERISTICS OF SURVEY RESPONDENTS

TABLE 3-2

Information on non-transportation-related impacts of the opening of the station was also requested. Ninety-four percent of the respondents made no changes in work habits, schools, jobs, etc., as a result of the opening of the station. Three percent of the respondents indicated that they made changes other than those listed on the questionnaire. Among them is "backtracking" (riding to a station further south and then switching to an inbound train).

3.2 TRIP CHARACTERISTICS

The questionnaire elicited information on the current trip-making patterns of the South Shore Extension riders in general, on how continuing riders have altered their trip-making habits, and on the habits of new riders. Eighty-nine percent of those who responded had used the Red Line regularly before the opening of Quincy Adams Station; the remaining 11 percent were new to the Red Line (see Table 3-3). These new riders were fairly evenly distributed among the five stations.

Prior to the opening of Quincy Adams, 18 percent of the new riders drove alone, nine percent carpooled, two percent used MBTA buses, six percent used private buses, 14 percent used some other mode, and 51 percent did not make the trip (see Table 3-4). It is interesting to note that 38 percent of the new riders who used Quincy Adams Station previously used autos to make the trip. This rate of diversion from the auto is higher than at any other station.

3.2.1 Boarding Station

In Table 3-5, the stations at which continuing riders boarded prior to the opening of Quincy Adams Station are compared with the stations at which they presently board. As one would expect, the most significant shifting of boarders was to Quincy Adams Station. Almost as many switched to Quincy Adams as to the other four stations combined. Of the continuing riders who switched to Quincy Adams, 55 percent formerly entered the system at Braintree, 23 percent at Quincy Center, eight percent at Wollaston, 10 percent at North Quincy, and four percent at other Red Line stations (Ashmont or Mattapan lines).

Of all the respondents who had boarded at Braintree "before," 22 percent shifted to other South Shore Extension stations. Over three-fourths of this 22 percent shifted to Quincy Adams Station. Of the respondents who had boarded at Quincy Center, 20 percent shifted to other stations: five percent to Braintree, eight percent to Quincy Adams, four percent to Wollaston, and three percent to North Quincy. Only nine percent of those who had boarded at Wollaston shifted stations: two percent to Braintree, three percent to Quincy Adams, two percent to Quincy Center, and three percent to North Quincy. Fifteen percent of the North Quincy users shifted: two percent to Braintree, five percent to Quincy Adams, two percent to Quincy Center, and six percent to Wollaston.

Station	Continuing Riders #	Continuing Riders % of Boardings at Station	Continuing Riders % of All Boardings	New Riders #	New Riders % of Boardings at Station	New Riders % of All Boardings	Total
Braintree	2,862	89%	24%	340	11%	23%	3,202
Quincy Adams	1,030	78	8	293	22	20	1,323
Quincy Center	2,728	91	23	283	9	19	3,011
Wollaston	3,134	92	26	255	8	17	3,389
North Quincy	2,341	89	19	300	11	20	2,641
No Response	-	-	-	-	-	-	222
Total	12,096	89%	100%	1,471	11%	100%	13,789

NOTE: Percentages given may not sum to 100, because of rounding.

TABLE 3-3

CONTINUING AND NEW RIDERS BY BOARDING STATION
6:30-9:30 A.M.
February 29, 1984

Previous Mode	Boarding Station: Braintree #	Braintree %	Quincy Adams #	Quincy Adams %	Quincy Center #	Quincy Center %	Wollaston #	Wollaston %	No. Quincy #	No. Quincy %	Total #	Total %
Drove alone	39	14%	94	35%	22	10%	24	13%	35	16%	214	18%
Carpooled	39	14	9	3	11	5	28	15	13	6	100	9
MBTA bus	-	-	5	2	8	4	8	4	4	2	25	2
Private bus	32	11	29	11	-	-	8	4	-	-	69	6
Did not make trip	146	52	101	37	113	54	101	55	135	61	596	51
Other	26	9	32	12	57	27	16	9	35	16	166	14
Total	282	100%	270	100%	211	100%	185	100%	222	100%	1,170	100%

NOTE: Percentages given may not sum to 100, because of rounding.

TABLE 3-4

PREVIOUS MODE OF TRAVEL OF NEW RIDERS, BY BOARDING STATION
6:30-9:30 A.M. SURVEY
February 29, 1984

Station Used Before Opening of Quincy Adams	Station Used After Opening of Quincy Adams					
	Braintree	Quincy Adams	Quincy Center	Wollaston	North Quincy	Total
Braintree	2,574 (90%)	574 (55%)	51 (2%)	57 (2%)	57 (2%)	3,312 (28%)
Quincy Center	149 (5%)	238 (23%)	2,494 (92%)	138 (5%)	109 (5%)	3,127 (26%)
Wollaston	55 (2%)	81 (8%)	51 (2%)	2,721 (88%)	87 (4%)	2,996 (25%)
No. Quincy	39 (1%)	109 (10%)	54 (2%)	138 (4%)	1,980 (85%)	2,320 (19%)
Other	29 (1%)	39 (4%)	46 (2%)	20 (1%)	83 (4%)	216 (2)
Total	2,846 (24%)	1,041 (9%)	2,696 (22%)	3,073 (26%)	2,315 (19%)	11,971 (100%)

NOTES: Percentages denote the proportion of the "after" boarders at a station who boarded "before" at the station indicated.

No response was given to this question on 1,818 questionnaires.

Percentages given may not sum to 100, because of rounding.

PRIOR AND PRESENT BOARDING STATIONS OF CONTINUING RIDERS
6:30-9:30 A.M. SURVEY
February 29, 1984

TABLE 3-5

The distribution of new riders by boarding station is presented also in Table 3-3. Twenty percent boarded at Quincy Adams, 23 percent at Braintree, 19 percent at Quincy Center, 17 percent at Wollaston, and 20 percent at North Quincy. New riders account for 22 percent of morning-peak-period ridership at Quincy Adams, 11 percent at Braintree, nine percent at Quincy Center, eight percent at Wollaston, and 11 percent at North Quincy.

3.2.2 Mode of Access

Modes of access by boarding station of the morning-peak survey respondents is presented in Table 3-6. As one can see, there was significant variation among the stations. Eighty percent of those who boarded at Quincy Adams and 58 percent of those who boarded at Braintree drove or rode with others in cars that were parked at the station. This would tend to indicate that the two stations attract riders from a fairly broad area. Another 10 percent of those who boarded at Quincy Adams and 27 percent of those who boarded at Braintree were dropped off by someone who did not park at the station.

Quincy Center is the only station that had a large proportion of arrivals by bus (40%). It also appears that Quincy Center, Wollaston, and North Quincy drew a large proportion of boarders from areas immediately surrounding the stations, since walking was the access mode for 24 percent of those who boarded at Quincy Center, 44 percent at Wollaston, and 33 percent at North Quincy.

3.2.3 Town of Origin

Town of origin by boarding station is presented in Table 3-7. On the survey day, sixty-nine percent of all riders came from Quincy (46%), Weymouth (12%), and Braintree (11%). The remaining 31 percent came from over 22 cities and towns in the area. Origins vary considerably among the stations. Only 42 percent of those who used Quincy Adams Station and 51 percent of those who used Braintree Station came from the three communities mentioned above. However, 82 percent of those who boarded at Quincy Center, 83 percent of those at Wollaston, and 71 percent of those at North Quincy came from Quincy, Weymouth and Braintree. The distribution of Red Line users in the South Shore is presented in Figure 3-2.

3.2.4 Trip Destination

According to the survey, 89 percent of the morning-peak-period boarders had destinations in the City of Boston, and the majority of these were destined for the downtown area. The City of Cambridge had the next largest proportion of trip ends (7 percent), while only one percent of all trips ended in Quincy. Only three percent of all trips ended in communities other than these three.

	Braintree	Quincy Adams	Quincy Center	Wollaston	North Quincy	Total
Park and ride	1,860 (58%)	1,061 (80%)	649 (21%)	1,352 (40%)	1,397 (52%)	6,318 (46%)
Kiss and ride	857 (27%)	137 (10%)	409 (13%)	502 (15%)	257 (10%)	2,162 (16%)
MBTA bus	317 (10%)	43 (3%)	1,185 (40%)	53 (2%)	109 (4%)	1,706 (12%)
Private bus	- -	- -	30 (1%)	- -	4 -	34 -
Walked	155 (5%)	84 (6%)	733 (24%)	1,506 (44%)	883 (33%)	3,361 (25%)
Bicycled	- -	2 -	- -	- -	4 -	6 -
Other	29 (1%)	2 -	27 (1%)	0 -	26 (1%)	84 (1%)
Total	3,218 (23%)	1,328 (10%)	3,033 (22%)	3,413 (25%)	2,681 (20%)	13,672 (100%)

NOTES: No response was given to this question on 117 questionnaires.

Percentages given may not sum to 100, because of rounding.

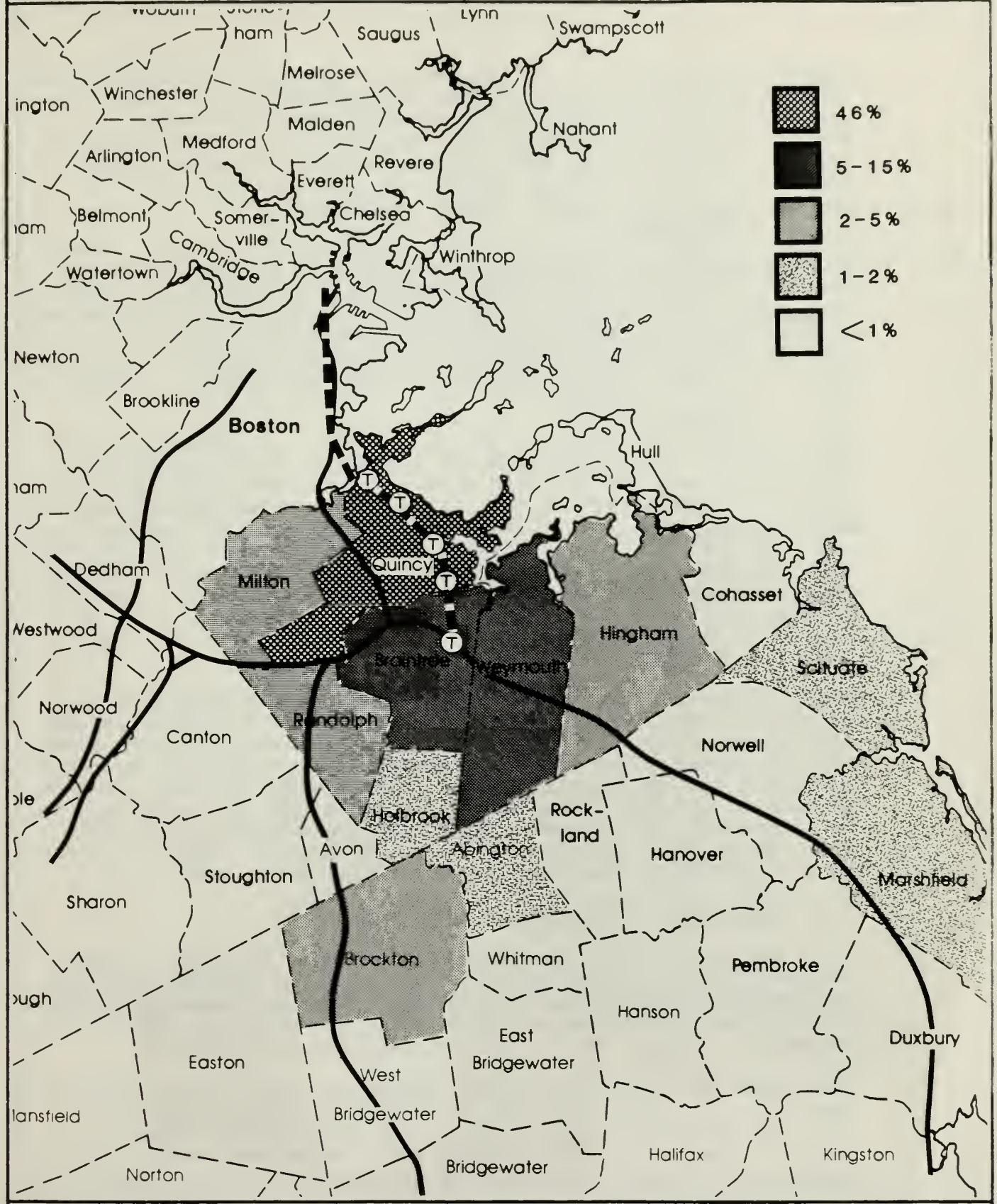
MODE OF ACCESS BY BOARDING STATION
6:30-9:30 A.M.
February 29, 1984

TABLE 3-6

	Station											
	Braintree		Quincy Adams		Quincy Center		Wollaston		North Quincy		Total	
	#	%	#	%	#	%	#	%	#	%	#	%
Quincy	32	1.0	206	16.0	1,810	60.0	2,466	73.0	1,732	66.0	6,246	46.0
Weymouth	627	20.0	156	12.0	434	14.0	292	9.0	104	4.0	1,613	12.0
Braintree	947	30.0	178	14.0	251	8.0	49	1.0	30	1.0	1,455	11.0
Hingham	103	3.0	56	4.0	234	8.0	85	3.0	22	.8	500	4.0
Randolph	175	5.0	111	8.0	11	.4	36	1.0	61	2.0	394	3.0
Milton	6	.2	2	.2	8	.3	134	4.0	244	9.0	394	3.0
Brockton	178	6.0	101	8.0	8	.3	32	1.0	26	1.0	345	3.0
Holbrook	249	8.0	24	2.0	8	.3	12	.4	4	.2	297	2.0
Marshfield	181	6.0	39	3.0	5	.2	12	.4	4	.2	242	2.0
Hull	13	.4	2	.2	102	3.0	36	1.0	35	1.0	189	1.0
Scituate	26	.8	28	2.0	32	1.0	61	2.0	35	1.0	182	1.0
Boston	3	0.0	-	-	20	.7	4	.1	142	5.0	169	1.0
Abington	84	3.0	39	3.0	8	.3	24	.7	4	.2	159	1.0
Hanover	65	2.0	24	2.0	5	.2	8	.2	13	.5	115	.8
Duxbury	61	2.0	30	2.0	5	.2	8	.2	9	.3	114	.8
Cohasset	10	.3	11	.8	38	1.0	45	1.0	9	.3	111	.8
Whitman	74	2.0	17	1.0	3	.1	8	.2	9	.3	111	.8
Rockland	71	2.0	13	1.0	3	.1	4	.1	17	.7	108	.8
Norwell	58	2.0	30	2.0	3	.1	-	-	9	.3	100	.7
Pembroke	52	2.0	24	2.0	3	.1	4	.1	13	.5	95	.7
Bridgewater	24	.7	26	2.0	-	-	4	.1	4	.2	58	.4
Hanson	36	1.0	9	.7	-	-	-	-	4	.2	48	.4
Stoughton	10	.3	24	2.0	-	-	4	.1	-	-	37	.3
Avon	13	.4	6	.4	-	-	-	-	9	.3	28	.2
Easton	-	-	17	1.0	-	-	8	.2	-	-	25	.2
Other	74	2.0	138	10.0	15	.5	33	1.0	76	3.0	336	3.0
Total	3,172	100	1,311	100	3,006	100	3,369	100	2,615	100	13,471	100

TOWN OF ORIGIN BY BOARDING STATION
6:30-9:30 A.M.
February 29, 1984

TABLE 3-7



TOWN OF ORIGIN
RED LINE/SOUTH SHORE EXTENSION RIDERS
6:30-9:30 A.M.
February 29, 1984

FIGURE
3-2

Eighty-four percent of the respondents planned to exit the system at some other station on the Red Line (66 percent exited at three downtown stations--South Station, Washington, and Park). Fourteen percent transferred to the Green Line, while only one percent transferred to the Orange Line and one percent to the Blue Line.

3.2.5 Trip Purpose

The trip purposes of those who responded to the survey are presented in Table 3-8 by boarding station. As one can see, there was almost no variation in trip purpose among the stations. Not unexpectedly, the majority of trips (92 percent) were work trips. School trips accounted for another seven percent of total trips, while all other categories made up only one percent.

3.2.6 Frequency of Use

According to the survey data, 87.1 percent of morning-peak passengers used the Red Line five or more times per week. This is not an unexpected response, since 92 percent of the respondents were making work trips. Five percent of the boarders used the Red Line four days per week, 3.7 percent three days, 1.6 percent two days, 0.9 percent one day, and 1.7 percent one day or less. Continuing riders made no significant changes in frequency of use.

3.2.7 Passengers' Reasons for Using the Red Line

Respondents' reasons for using the Red Line are presented in Table 3-9. Multiple responses were allowed; therefore, percentages are based on the number of responses rather than the number of respondents. The most frequently cited reasons (63 percent) for using the Red Line emphasize the avoidance of negative side effects of driving: traffic, parking, or fuel consumption. Only 20 percent of the responses emphasize the benefits of transit use: lower cost, less travel time, or comfort. Fourteen percent of the responses cited the unavailability of an auto.

3.3 COMPARISON OF NEW AND CONTINUING RIDERS

This section compares the trip-making habits and socioeconomic characteristics of new and continuing riders. Comparison data are presented in Figures 3-3 and 3-4 (absolute numbers for trip-making characteristics can be found in the appendix, Tables A-1 to A-4).

The modes of access of new and continuing riders are presented in Figure 3-3. New riders were somewhat more likely to park and ride and somewhat less likely to walk than regular riders. However, the proportions for all other modes were basically the same.

	Braintree	Quincy Adams	Quincy Center	Wollaston	North Quincy	Total
Work	2,975 (92%)	1,225 (93%)	2,798 (92%)	3,179 (93%)	2,467 (92%)	12,644 (92%)
School	207 (6%)	71 (5%)	210 (7%)	211 (6%)	196 (7%)	894 (7%)
Shopping	13 (0%)	4 (0%)	11 (0%)	0 (0%)	4 (0%)	32 (0%)
Personal business	26 (1%)	11 (1%)	22 (1%)	8 (0%)	9 (0%)	75 (1%)
Social/Recreation	3 (0%)	0 (0%)	3 (0%)	0 (0%)	0 (0%)	6 (0%)
Other	6 (0%)	11 (1%)	5 (0%)	12 (0%)	9 (0%)	43 (0%)
Total	3,230	1,322	3,049	3,409	2,685	13,695

NOTES: No response was given to this question on 94 questionnaires.

Percentages given may not sum to 100, because of rounding.

TRIP PURPOSE BY BOARDING STATION
6:30-9:30 A.M.
February 29, 1984

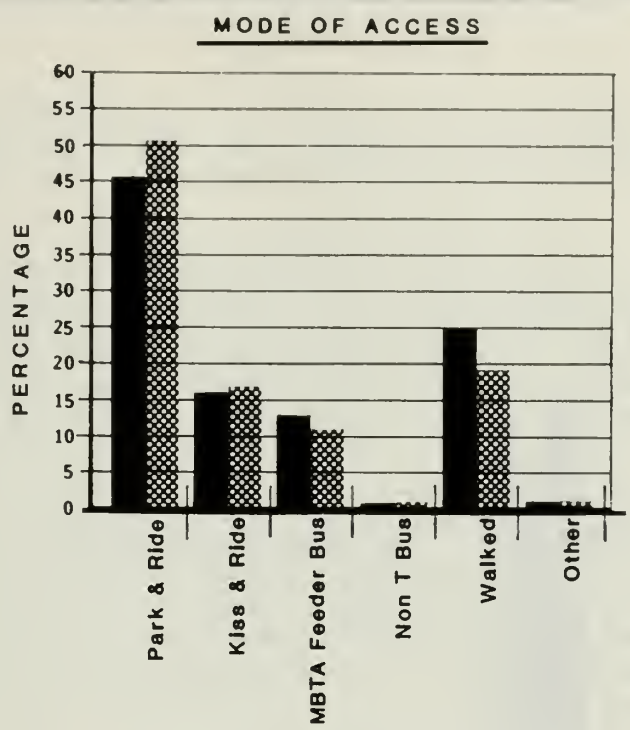
TABLE 3-8

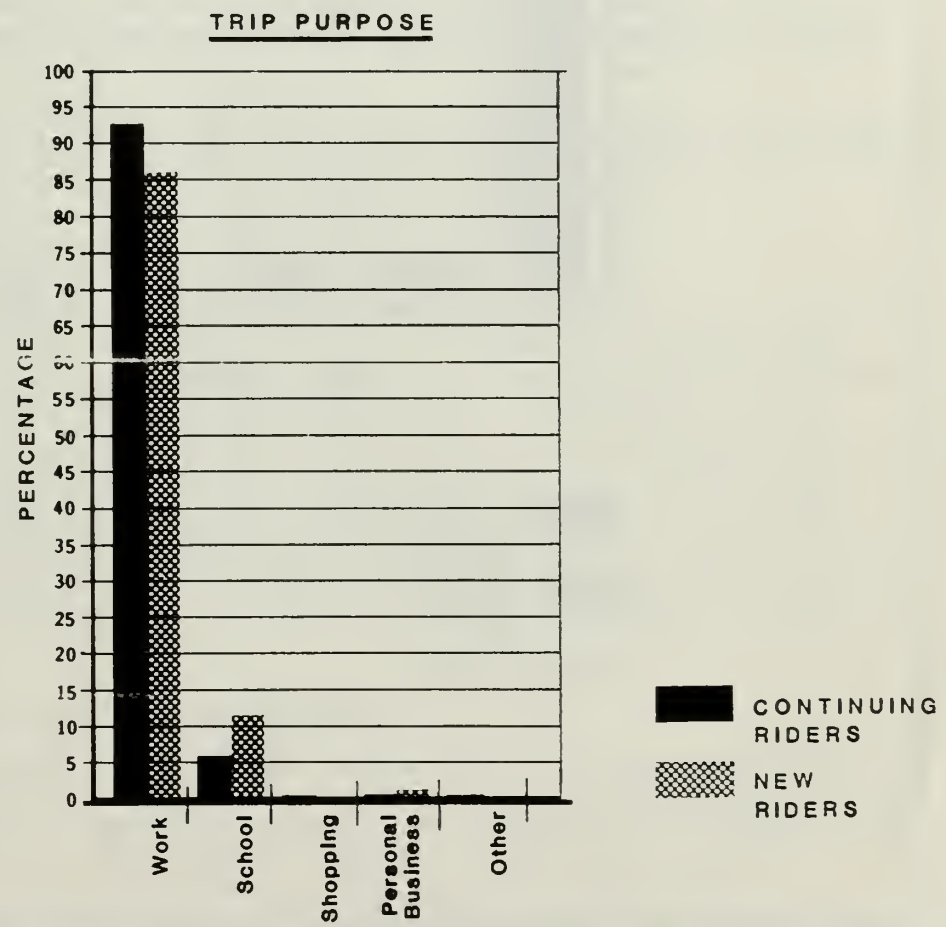
	Braintree	Quincy Adams	Quincy Center	Wollaston	North Quincy	Total
Avoid traffic	2,188 (35%)	970 (36%)	1,490 (28%)	1,818 (28%)	1,332 (28%)	7,798 (30%)
Auto not available	685 (11%)	146 (5%)	1,129 (21%)	915 (14%)	638 (13%)	3,514 (14%)
Lower cost	883 (14%)	378 (14%)	851 (16%)	1,231 (19%)	819 (17%)	4,162 (16%)
Conserve gas	617 (10%)	290 (11%)	433 (8%)	538 (8%)	365 (7%)	2,243 (9%)
Avoid downtown parking	1,517 (24%)	684 (25%)	1,105 (20%)	1,491 (23%)	1,310 (27%)	6,107 (24%)
Comfort	81 (1%)	43 (2%)	37 (1%)	44 (1%)	39 (1%)	244 (1%)
Less travel time	149 (2%)	101 (4%)	162 (3%)	157 (2%)	135 (3%)	704 (3%)
Other	153 (2%)	88 (3%)	186 (3%)	272 (4%)	179 (4%)	878 (3%)
Total	6,273 (24%)	2,700 (11%)	5,393 (21%)	6,466 (25%)	4,818 (19%)	25,650 (100%)

NOTE: Percentages given may not sum to 100, because of rounding.

PASSENGERS' REASONS FOR USING THE RED LINE
6:30-9:30 A.M.
February 29, 1984

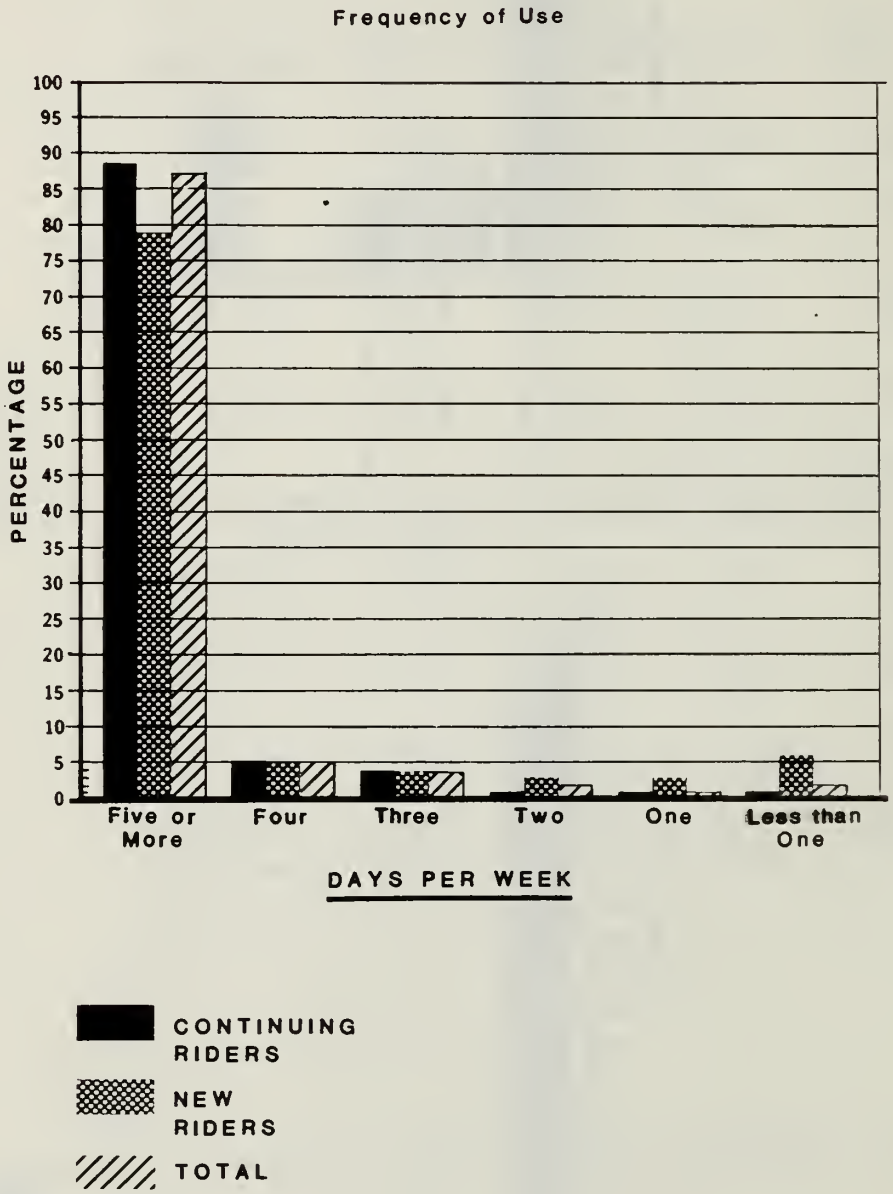
TABLE 3-9





TRIP-MAKING CHARACTERISTICS
CONTINUING AND NEW RIDERS
RED LINE/SOUTH SHORE EXTENSION
6:30-9:30 A.M., February 29, 1984

FIGURE 3-3 (p.1)



TRIP-MAKING CHARACTERISTICS
CONTINUING AND NEW RIDERS
RED LINE/SOUTH SHORE EXTENSION
6:30-9:30 A.M., February 29, 1984

FIGURE 3-3 (p.2)

Work was the predominant trip purpose for both new and continuing riders, as shown in Figure 3-3; however, new riders made proportionately fewer work trips and more school trips than continuing riders.

Continuing riders used the system slightly more frequently than new riders, as shown in Figure 3-3. Eighty-eight percent of the continuing riders used the Red Line five or more days per week, whereas 79 percent of the new riders did so. Also, six percent of the new riders used the Red Line less than one day per week, whereas only one percent of the continuing riders did so.

Data on age and income are presented in Figure 3-4. New riders were younger than continuing riders. Almost 35 percent of the new riders were less than 24 years old. Approximately 20 percent of the continuing riders were in this age group. Twenty-five percent of the continuing riders were 45-64 years of age, whereas only 14 percent of new riders were. The average age of continuing riders was approximately 37 years old, the average age of new riders, approximately 32.

The income distributions of the two groups were fairly similar; however, a larger proportion of new riders had household incomes of less than $20,000 per year.

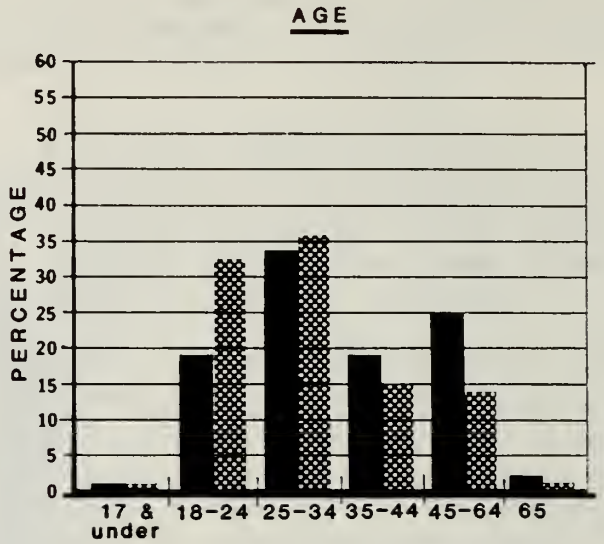
There was very little difference in the responses the two groups gave for the non-transportation related impacts attributed to the opening of the new station, as shown in Table 3-10.

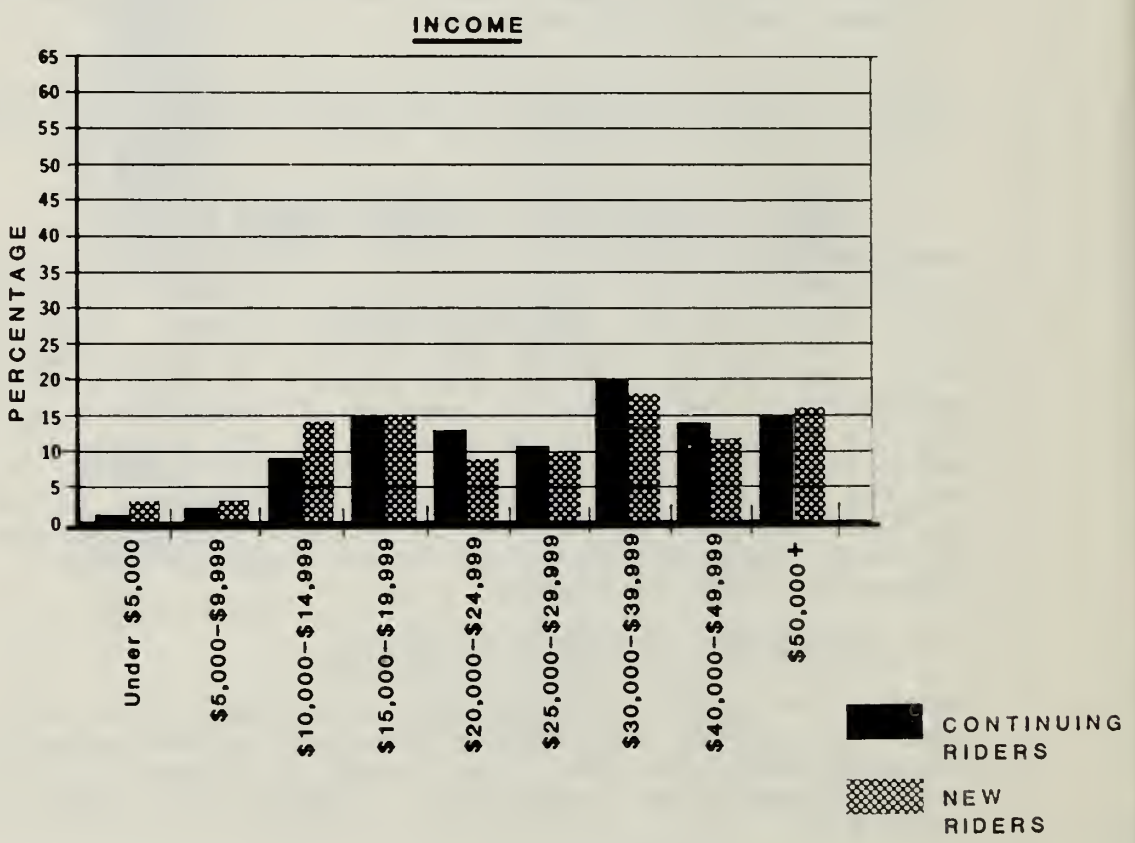
3.4 PERCEIVED QUALITY OF TRANSIT SERVICE

Respondents to the questionnaire were asked to rate eight aspects of Red Line service on a scale of one to five, one being very poor, three average, and five unusually good. Their perceptions of the quality of service they receive are presented in Table 3-11. The rating given to each aspect of service can be summarized in terms of what percentage of respondents considered it average or better: the reliability of the trains, 37 percent; the cleanliness of the trains, 64 percent; comfort, 47 percent; seating availability, 19 percent; the appearance of the cars, 65 percent; schedule adherence, 35 percent; the appearance of the stations (particularly on the South Shore) 62 percent; the helpfulness of MBTA, 63 percent.

3.5 PASSENGERS' COMMENTS ON SERVICE

Forty-eight percent of those who responded to the survey wrote at least one comment about transit service in the space provided on the questionnaire. The total number of comments is 11,253, which is 1.7 comments per respondent. Comments are summarized in Table 3-12.





SOCIOECONOMIC CHARACTERISTICS
CONTINUING AND NEW RIDERS
RED LINE/SOUTH SHORE EXTENSION
6:30-9:30 A.M.. February 29, 1984

FIGURE 3-4

	Continuing Riders		New Riders	
	#	%	#	%
Relocated housing	41	0.4%	19	1.4%
Changed jobs	7	0.1	11	0.8
Sold auto	8	0.1	2	0.1
Changed schools	146	1.3	18	1.4
Changed shopping habits	9	0.1	2	0.2
Changed work hours	30	0.3	2	0.2
Other	325	2.8	28	2.1
No change	10,863	95.0	1,254	93.8
Total	11,429	100.0%	1,336	100.0%

NOTES: No response was given to this question on 1,024 questionnaires.

Percentages given may not sum to 100, because of rounding.

NON-TRANSPORTATION IMPACTS OF THE
OPENING OF QUINCY ADAMS STATION
6:30-9:30 A.M. SURVEY, February 29, 1984

TABLE
3-10

	Very Poor 1	2	Average 3	4	Unusually Good 5
Reliability ("getting there on time")	35.5%	27.1%	26.3%	7.2%	3.9%
Cleanliness of trains	12.2	23.4	43.2	14.9	6.3
Comfort of ride	22.8	29.9	37.1	7.9	2.3
Adequate seating on board	59.1	21.4	14.3	3.3	1.9
Appearance of cars	11.2	23.9	46.6	13.5	4.8
On schedule	34.4	30.5	25.3	7.2	2.6
Appearance of stations	16.3	22.0	37.8	16.3	7.6
Helpfulness of employees	17.9	19.0	34.9	16.7	11.4

PERCEPTION OF TRANSIT SERVICE OUALITY
RED LINE/SOUTH SHORE EXTENSION
6:30-9:30 A.M. SURVEY, February 29, 1984

TABLE 3-11

The most numerous comments (about 51 percent) were complaints about service. Approximately eight percent of the comments indicated dissatisfaction with service in general; seven percent, a need for more frequent service; six percent, that service was unreliable; four percent, a need for faster or longer trains; three percent, that maintenance was poor; three percent, that there were too many signal and switching problems; and three percent, that trains were too crowded to take on more passengers at Wollaston and North Quincy (and that this problem was exacerbated by the opening of Quincy Adams). Another 13 percent were a variety of negative service comments, including requests for express trains and complaints based on the perception that there are more Ashmont than Braintree trains.

Complaints about amenities made up approximately twenty-three percent of the comments. The most common complaints were that trains were too crowded, the public address system was not used to announce the reasons for delays, and ventilation and temperature control were poor.

Only about one percent of the comments dealt with costs; it was complained that fares and parking fees were too high at Braintree and Quincy Adams. Approximately four percent of the comments concerned MBTA employees; two percent indicated the need for improvement in bus service; one percent indicated the need for new or additional service; and four percent were positive (1.3 percent of the comments were that service had improved recently).

Fourteen percent of the comments fall into the "other" category, which includes complaints about the old cars, the absence of a crossover at the University of Massachusetts, and coordination between trains and buses.

	Comments	
Operations	#	%
Dissatisfied with service	908	8.1%
Need more frequent service	793	7.0
Service is unreliable	657	5.8
Need faster or longer trains	415	3.7
Can't get on trains at Wollaston and North Quincy since Quincy Adams opened	381	3.4
Poor maintenance	355	3.2
Too many signal & switching problems	351	3.1
Too many breakdowns	317	2.8
Seem to be more Ashmont than Braintree trains	298	2.6
Start trains at Quincy Center	223	2.0
Add more trains during reconstruction	217	1.9
Too many delays	193	1.7
Run express trains	179	1.6
Start trains at Wollaston or North Quincy	174	1.5
Braintree trains shouldn't stop at Broadway & Andrew during peak	129	1.1
Dislike turning trains at Park Street	115	1.0
Total	5,705	50.7%
Amenities		
Crowded trains	543	4.8%
Use P.A. system to announce reasons for delay	479	4.3
Poor ventilation & temperature control	384	3.4
Need pedestrian access at Quincy Adams	260	2.3
Stations not clean	230	2.0
Jerky, uncomfortable rides	103	0.9
Riding backward to get to a boardable train necessary, especially after Quincy Adams opened	94	0.8
Trains not clean	94	0.8
Escalators don't work or run in the wrong direction	91	0.8
Enclose platforms	83	0.7
Announce stops	79	0.7
Announcements frequently garbled	108	1.0
Total	2,548	22.7%
MBTA Employees		
Employees rude and not helpful	219	1.9%
Poor management	81	0.7
Employees incompetent	70	0.6
Additional police needed	65	0.6
Total	435	3.8%

SURVEY RESPONDENTS' COMMENTS ON MBTA SERVICE
6:30-9:30 A.M. SURVEY
February 29, 1984

TABLE 3-12 (p.1)

	Comments	
Buses	#	%
More buses needed	74	0.6
Additional routes needed	56	0.5
Improve service	54	0.5%
Total	184	1.6%
Costs		
Fares & parking fees too high at Braintree & Quincy Adams	149	1.3%
Total	149	1.3%
New Service		
Improve service before building extension	39	0.3
Extend line further south	37	0.3
No need for Quincy Adams station	25	0.2%
Total	101	0.9%
Parking		
More lots or garages needed	51	0.4%
Total	51	0.4%
Favorable Comments		
Pleased with service in general	156	1.4%
Service improved recently	151	1.3
Like announcements of where trains are & when there are delays	74	0.6
Employees helpful	69	0.6
Like Quincy Adams Station	53	0.5
Total	503	4.5%
Other	1,577	14.0%
TOTAL RESPONSES	11,253	100.0%

NOTE: Percentages given may not sum to 100, because of rounding.

SURVEY RESPONDENTS' COMMENTS ON MBTA SERVICE
6:30-9:30 A.M. SURVEY
February 29, 1984

TABLE 3-12 (p.2)

4.0 COMPARISON OF 1980 AND 1984 SURVEY RESULTS

In this section, responses from the surveys conducted when Braintree Station opened in 1980 and when Quincy Adams opened are compared (see Tables 4-1 to 4-3). The results of the Braintree survey are documented fully in the CTPS report, An Impact Analysis of the Red Line Extension to Braintree, June 1981. The 1980 survey was distributed on October 8, 1980.

4.1 SOCIOECONOMIC CHARACTERISTICS

There are no significant differences in age, auto ownership, or auto availability. There are some differences in yearly household income; however, they are due most likely to the effects of inflation during the last four years.

4.2 MODE OF ACCESS

There appear to be significant differences in mode of access, as shown in Table 4-1. In 1980, 35 percent of all respondents came by auto, alone or with others, and parked at the station. In 1984, 46 percent of all respondents indicated that they did so. In 1980, 21 percent of all respondents took buses to the stations; only 12 percent did so in 1984. There is little or no difference in the other modes.

4.3 TOWN OF ORIGIN

A slight shift in origin patterns occurred during the four-year period, as shown in Table 4-2. In 1980, 73 percent of all boarders came from Quincy, Braintree and Weymouth. The corresponding proportion for 1984 was 69 percent. The category of "other" communities, which includes some widely scattered South Shore origins, accounted for 16 percent of 1984-survey riders. The corresponding figure for 1980 was 10 percent.

4.4 TRIP DESTINATION

There has been no significant change in the destinations of morning-peak trips.

4.5 TRIP PURPOSE

There was no significant change in trip purpose: work trips made up 90 percent of all trips in 1980, 92 percent in 1984.

	1980		1984	
	#	%	#	%
Park and ride	3,810	35%	6,318	46%
Kiss and ride	1,630	15	2,162	16
Bus	2,330	21	1,740	12
Walk	2,940	27	3,361	25
Other	110	1	90	1
Total	10,810	100%	13,672	100%

NOTES: No response was given to this question on 70 questionnaires in 1980 and 117 in 1984.

Percentages given may not sum to 100, because of rounding.

MODE OF ACCESS TO STATION
FOLLOWING OPENING OF BRAINTREE STATION (1980)
AND QUINCY ADAMS STATION (1984)
6:30-9:30 A.M.

TABLE 4-1

	1980		1984	
	#	%	#	%
Quincy	5,120	48.3%	6,246	46.4%
Weymouth	1,470	14.0	1,613	12.0
Braintree	1,160	10.9	1,455	10.8
Hingham	540	5.1	500	3.7
Milton	290	2.7	394	2.9
Randolph	*	*	394	2.9
Brockton	200	1.9	345	2.6
Holbrook	190	1.8	297	2.2
Cohasset	170	1.6	111	0.8
Hull	170	1.6	189	1.4
Scituate	140	1.4	182	1.3
Other	1,100	10.4	1,747	13.0
No Answer	330	-	316	-
Total	10,890	100.0%	13,789	100.0%

*Not available.

NOTE: Percentages given may not sum to 100, because of rounding.

TOWN OF ORIGIN
FOLLOWING OPENING OF BRAINTREE STATION (1980)
AND QUINCY ADAMS STATION (1984)
6:30-9:30 A.M.

TABLE 4-2

4.6 PASSENGERS' REASONS FOR USING THE RED LINE

While there is no change in the proportions of those who use the Red Line to avoid the negative effects of driving versus those who use it because of the benefits of using transit, there have been some changes within those two categories (see Table 4-3). In 1980, 24 percent of all respondents used the Red Line to avoid traffic and 16 percent used it to conserve gas. In 1984, 30 percent used it to avoid traffic and nine percent to conserve gas. In 1980, 11 percent and six percent of respondents said that they used the Red Line because of lower cost and less travel time, respectively. The corresponding proportions for 1984 were 16 percent and three percent.

	1980	1984
Avoid traffic	24%	30%
Avoid parking	23	24
Conserve gas.	16	9
	63%	63%
Lower cost	11%	16%
Comfort	2	1
Less travel time	6	3
	19%	20%
Auto not available	15%	14%
Other	3	3
	18%	17%
Total	100%	100%

NOTE: Percentages given may not sum to 100, because of rounding.

REASONS FOR USING TRANSIT
FOLLOWING OPENING OF BRAINTREE STATION (1980)
AND QUINCY ADAMS STATION (1984)
6:30-9:30 A.M.

TABLE 4-3

5.0 PARKING CHARACTERISTICS

At the transit-station parking facilities, information was collected on arrival rates and the level of facility occupancy. In this section, the results of the analysis of these data are discussed.

5.1 ARRIVAL RATE

The number of vehicles entering each parking facility during fifteen-minute intervals was recorded during the morning peak period on February 29, 1984 (see Figure 5-1). Braintree and Wollaston had the earliest peak fifteen-minute interval (7:00 to 7:15), while Quincy Adams and North Quincy had the latest (8:00 to 8:15). (The peak interval was actually 45 minutes--7:30-8:15--at North Quincy, since virtually the same number of vehicles entered during each of three fifteen-minute periods.) The peak fifteen-minute interval began at 7:45 at Quincy Center Station.

Due to time and personnel constraints, auto arrival rates were not determined in 1983 before Quincy Adams Station opened. Therefore, 1980 data (from the survey discussed in section 4.0) were used for comparison. The peak fifteen-minute intervals at Braintree and North Quincy started fifteen minutes earlier in 1984 than in 1980, and a full hour earlier at Wollaston. Only at Quincy Center did the peak interval begin no earlier in 1984 than in 1980.

Although the peak fifteen-minute interval at the Braintree garage occurred only fifteen minutes earlier in 1984 than in 1980, the flow of vehicles into the garage was significantly more intense between 6:30 A.M. and the end of the peak interval than it was in 1980. In 1984, 68 percent of all vehicles that entered after 6:30 A.M. had parked by the end of the peak interval, while only 53 percent had done so in 1980.

One can not be sure if these changes were caused by the opening of the new station, by increases in traffic and transit ridership during the four-year period, or by a combination of these factors.

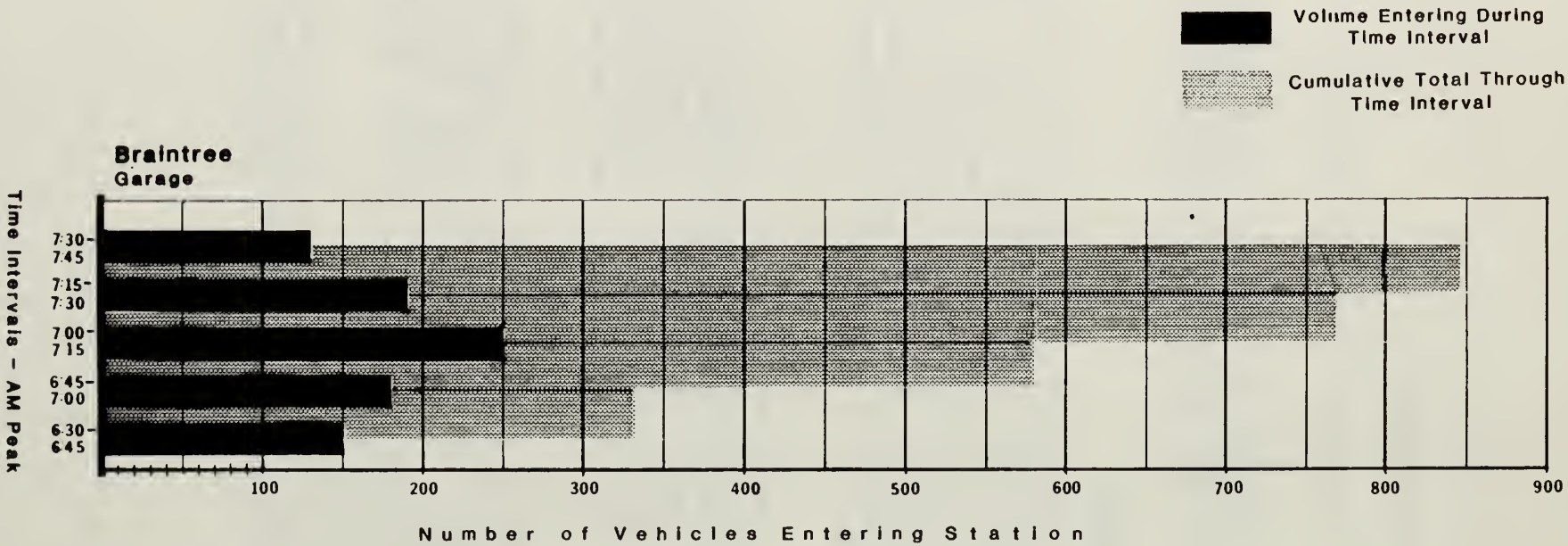


FIGURE 5-1 (p.1)

AUTO-ARRIVAL RATES AT PARKING FACILITIES
February 29, 1984

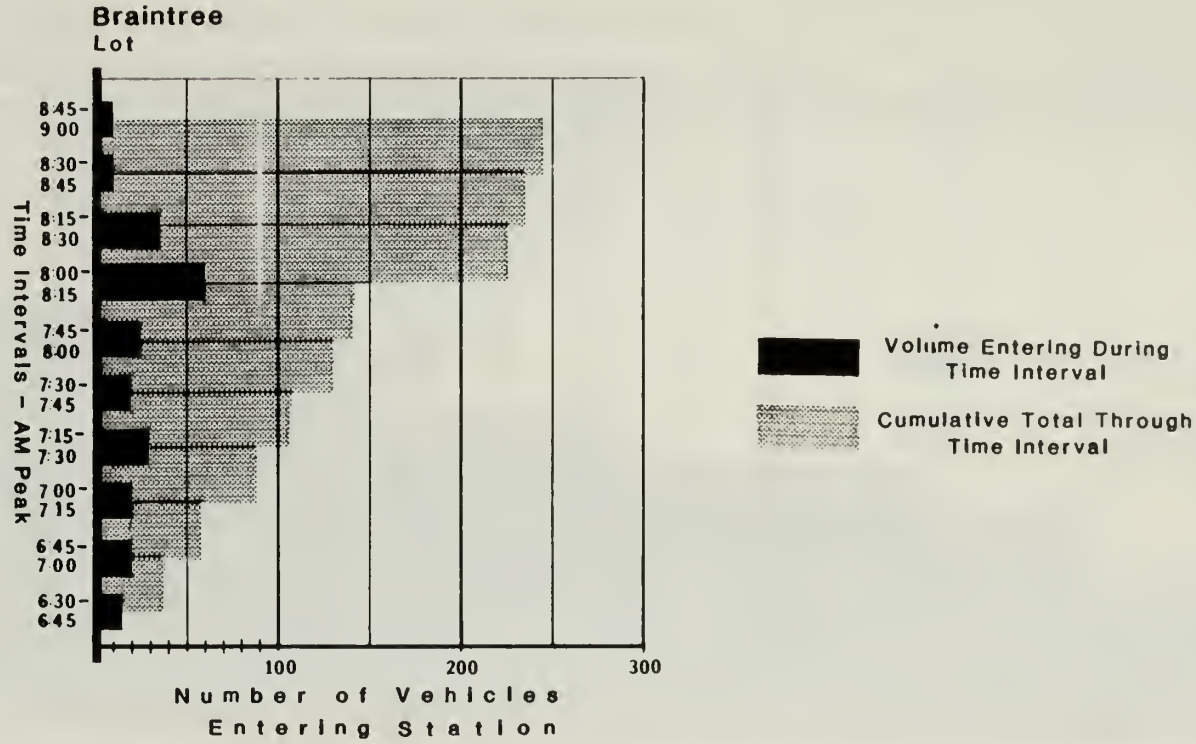


FIGURE
5-1
(p.2)

AUTO-ARRIVAL RATES AT PARKING FACILITIES
February 29, 1984

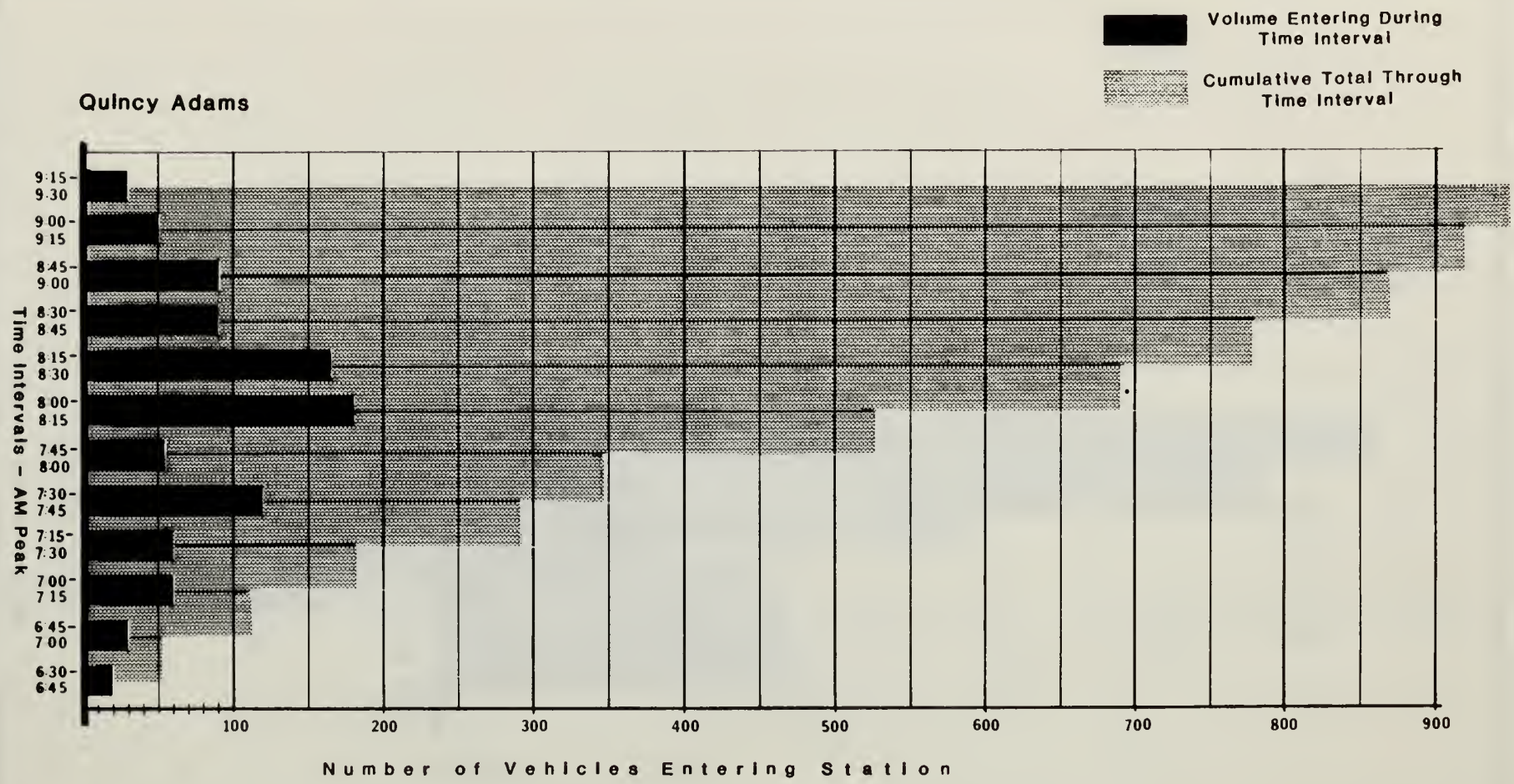


FIGURE 5-1 (p.3)

AUTO-ARRIVAL RATES AT PARKING FACILITIES
February 29, 1984

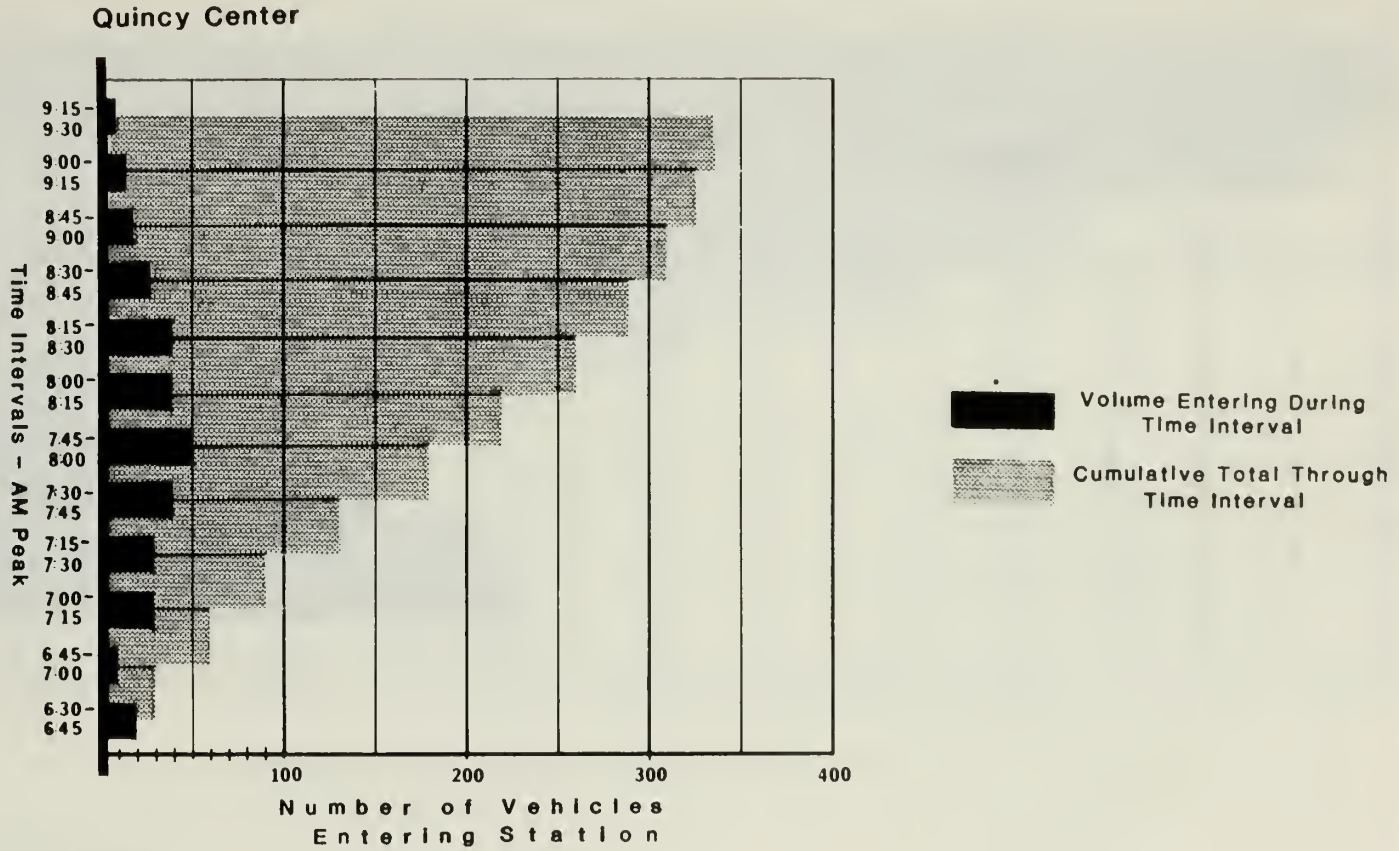


FIGURE 5-1 (p.4)

AUTO-ARRIVAL RATES AT PARKING FACILITIES
February 29, 1984

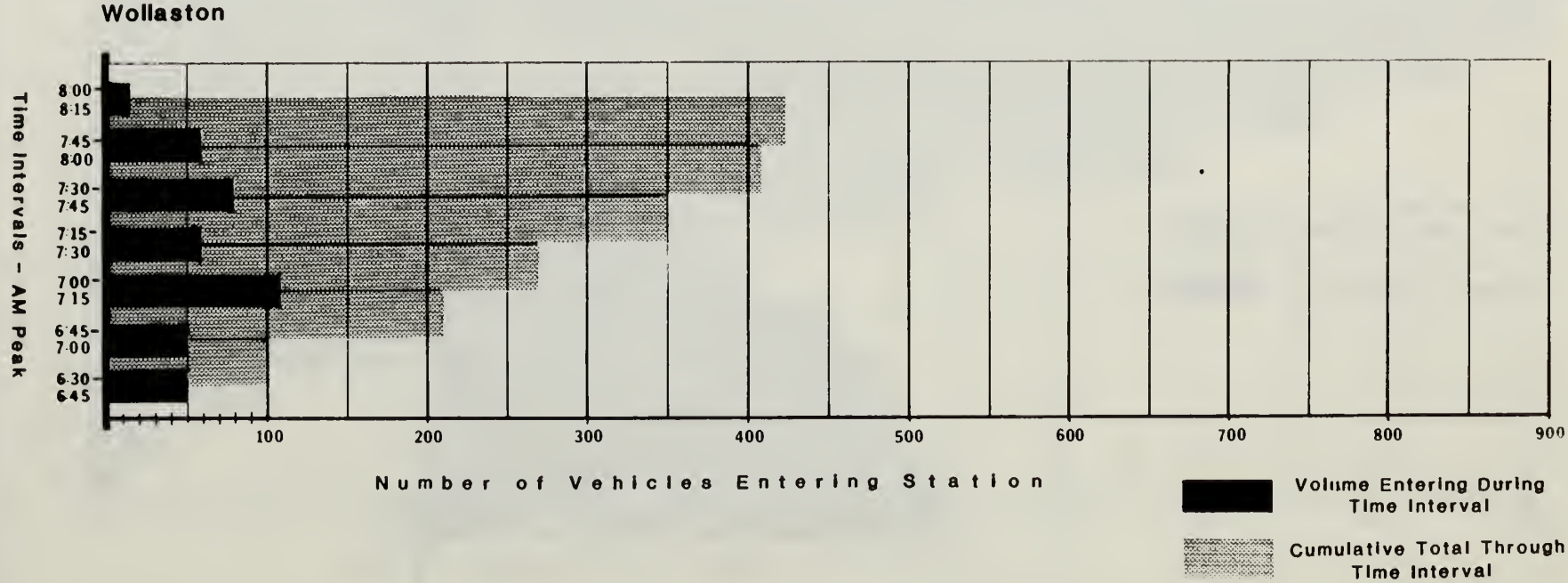
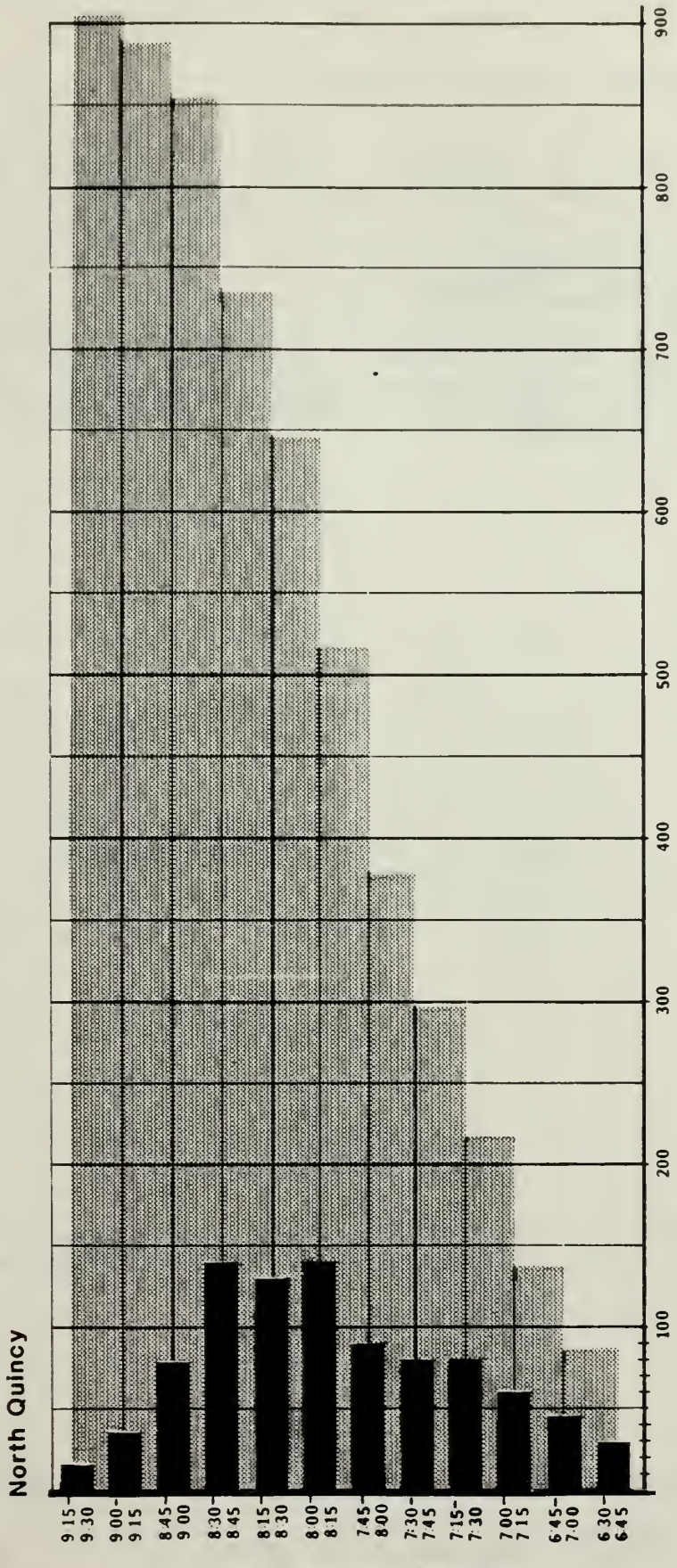


FIGURE 5-1 (p.5)

AUTO-ARRIVAL RATES AT PARKING FACILITIES
February 29, 1984



AUTO-ARRIVAL RATES AT PARKING FACILITIES
February 29, 1984

FIGURE 5-1 (p.6)

5.2 LEVEL OF PARKING-FACILITY OCCUPANCY

The number of cars using the various parking facilities is presented in Table 5-1. On September 1, 1983, the vehicles were counted as the surveyors recorded license plate numbers, beginning at 9:30 A.M. On February 29, 1984, vehicles were counted and license plate numbers were recorded as the vehicles entered the parking facilities between 6:30 and 9:30 A.M. The Braintree and Wollaston facilities closed at approximately 7:40 and 8:05 A.M., respectively, because they were at capacity. In 1980, they were at capacity closer to 9:30 A.M. There are two lots at North Quincy Station. The one on Newport Street closed when it reached capacity shortly after 8:45 A.M. It appears that parking at Quincy Center has decreased.

	Before (September 1, 1983)	After (February 29, 1984)	Official Parking Capacity
Braintree			
- multi-level parking garage	1,200	1,240*	1,100
- parking lot	300	250	300
Quincy Adams			
- multi-level parking garage	-	940	2,000
Quincy Center			
- multi-level parking garage	465	330	850
Wollaston			
- parking lot	500	500	500
North Quincy			
- 2 parking lots	1,105	905**	850
Total	3,570	4,165	5,600

*There were problems with the original February Braintree garage data; therefore, counts were taken again in March.

**153 parking spaces were eliminated between September and February.

LEVEL OF PARKING-FACILITY OCCUPANCY
BEFORE AND AFTER THE OPENING
OF QUINCY ADAMS STATION (9:30 A.M.)

TABLE 5-1

6.0 TRAFFIC PATTERNS

The traffic volumes in the vicinity of Quincy Adams Station before and after the station and its garage opened were analyzed. The data were obtained from the Bureau of Transportation Planning and Development of the Massachusetts Department of Public Works, which measured volumes with automatic traffic recorders (ATRs), at the locations indicated in Figure 6-1, for a four-day period beginning on August 29, 1983, and for another five-day period beginning on February 27, 1984. The ATRs provided continuous traffic volumes; average daily traffic (ADT) volumes were obtained from these counts.

From Table 6-1, it can be seen that traffic increased on all of the studied roadways. The largest daily increase (3,265 vehicles) was on Washington Street northbound just west of Centre Street. At this location, morning-peak traffic nearly doubled (+94%) and evening-peak traffic increased by 83 percent. There were also large increases in volume during the two peak periods on Centre Street north of Burgin Parkway. The peak hour at this location occurred an hour later (5:00 to 6:00 P.M. rather than 4:00 to 5:00 P.M.) after the station opened, and saw 73 percent more traffic. Note that the volumes include some of the ramp traffic to and from the station: kiss-and-ride traffic would be included in these volumes; park-and-ride traffic would use different ramps.

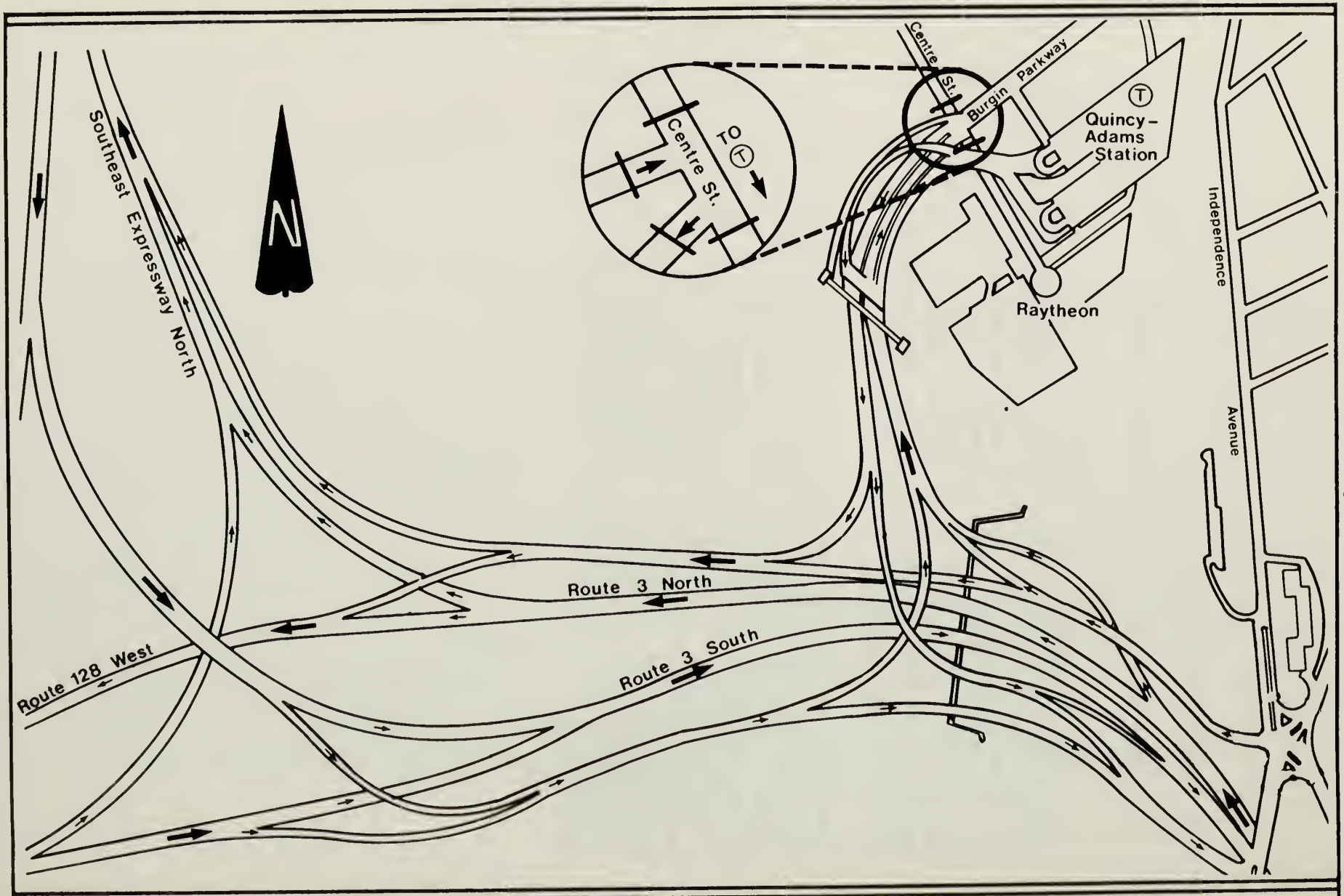


FIGURE 6-1

LOCATIONS OF AUTOMATIC TRAFFIC RECORDERS
August 1983, February 1984

	ADT			Morning Peak Period (6:00-9:00 A.M.)			Evening Peak Period (3:00-6:00 P.M.)			Peak One-hour Period		
	Before	After	Change	Before	After	Change	Before	After	Change	Before	After	Change
Washington Street northbound, west of Centre Street	4,373	7,638	+75%	1,256	2,437	+94%	880	1,608	+83%	(7-8 AM) 720	(7-8 AM) 1,082	+50%
Washington Street southbound, west of Centre Street	5,068	5,939	+17%	618	882	+43%	1,714	2,149	+25%	(4-5 PM) 747	(4-5 PM) 905	+21%
Centre Street north of Burgin Parkway	5,639	8,882	+57%	1,001	1,912	+91%	1,480	2,539	+71%	(4-5 PM) 554	(5-6 PM) 960	+73%
Centre Street south of Burgin Parkway	2,487	3,097	+24%	650	965	+48%	769	1,061	+40%	(4-5 PM) 455	(4-5 PM) 579	+27%

TABLE 6-1

TRAFFIC VOLUMES BEFORE AND AFTER THE OPENING OF QUINCY ADAMS STATION
August 1983, February 1984

7.0 CONCLUSIONS

The major conclusions of this impact analysis of the opening of Quincy Adams Station are as follows:

- Average weekday morning-peak ridership for all stations, after Quincy Adams Station opened, totalled 13,324, which is 6.6-percent higher than before the station opened.

- Boardings at South Shore Extension stations on the survey day, between 6:30 and 9:30 A.M., totalled 13,789. The survey results indicate that 11 percent of these riders did not usually use the Red Line for the trip prior to the opening of Quincy Adams. Of these riders, 51 percent did not make the trip previously. 27 percent carpooled or drove alone, 6 percent used private buses, 2 percent used MBTA buses, and 14 percent used some other mode to make the trip.

- Boardings at Quincy Adams on the survey day, between 6:30 and 9:30 A.M., totalled 1,328. The survey results indicate that 78 percent of these riders had usually used the Red Line for the trip prior to the opening of the new station. Of these continuing Red Line users who boarded at Quincy Adams, 55 percent had previously used Braintree Station, 23 percent Quincy Center, 8 percent Wollaston, 10 percent North Quincy, and 4 percent some station other than those on the South Shore Extension.

- The peak hour at Braintree, Quincy Center, and Wollaston started fifteen minutes earlier after the new station opened than before.

- The peak fifteen-minute interval at Braintree, Quincy Center, and Wollaston represented a larger proportion of total morning-peak boardings after Quincy Adams opened than before.

- Between October 1980 and February 1984, there was a significant increase in the use of autos and a decrease in the use of buses to reach the South Shore Extension rapid transit stations. The changes are due, in part, to the availability of additional parking spaces. New transit riders use autos as an access mode more than continuing riders.

- The peak fifteen-minute interval for auto arrivals at the stations' parking facilities in February 1984 began fifteen minutes earlier at Braintree and North Quincy stations and an hour earlier at Wollaston Station than in October 1980.

- The Braintree and Wollaston parking facilities were at capacity by approximately 8:00 A.M. in early 1984. In 1980, there were spaces available until 9:30 A.M.

- There was a significant increase in daily traffic volumes on segments of Washington and Centre streets near Quincy Adams Station.

APPENDIX

	Continuing Riders	New Riders	Total
Park and ride	5,486 (46%)	753 (51%)	6,239 (46%)
Kiss and ride	1,891 (16%)	252 (17%)	2,143 (16%)
MBTA bus	1,512 (13%)	169 (11%)	1,681 (12%)
Private bus	30 (0%)	4 (0%)	34 (0%)
Walk	3,041 (25%)	281 (19%)	3,325 25%
Bicycle	6 (0%)	0 (0%)	6 (0%)
Other	74 (1%)	10 (1%)	84 (1%)
Total	12,039 (89%)	1,468 (11%)	13,507 (100%)

NOTES: No response was given to this question on 282 questionnaires.

Percentages given may not summ to 100, because of rounding.

MODE OF ACCESS
6:30-9:30 A.M.
February 29, 1984

TABLE A-1

	Continuing Riders	New Riders	Total
Work	11,233 (93%)	1,263 (86%)	12,496 (92%)
School	712 (6%)	171 (12%)	884 (6%)
Shopping	29 (0%)	3 (0%)	32 (0%)
Personal business	51 (0%)	21 (1%)	72 (1%)
Social/Recreation	6 (0%)	0 (0%)	0 (0%)
Other	37 (0%)	6 (0%)	43 (0%)
Total	12,069 (89%)	1,465 (11%)	13,534 (100%)

NOTES: No response was given to this question on 255 questionnaires.

Percentages given may not summ to 100, because of rounding.

TRIP PURPOSE
6:30-9:30 A.M.
February 29, 1984

TABLE A-2

Days/Week	Continuing Riders	New Riders	Total
Five or more	10,373 (88%)	1,142 (79%)	11,515 (87%)
Four	584 (5%)	80 (5%)	664 (5%)
Three	414 (4%)	65 (4%)	479 (4%)
Two	172 (1%)	38 (3%)	211 (2%)
One	79 (1%)	37 (3%)	116 (1%)
Less than one	144 (1%)	82 (6%)	226 (2%)
Total	11,766 (89%)	1,445 (11%)	13,211 (100%)

NOTES: No response was given to this question on 578 questionnaires.

Percentages given may not summ to 100, because of rounding.

FREQUENCY OF USE
6:30-9:30 A.M.
February 29, 1984

TABLE A-3